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RENEWABLE RESOURCE
GRANT AND LOAN
PROGRAM

January 1999

Project Evaluations
and Funding
Recommendations
and
Biennium Status Report

Volume 5

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Renewable Resource Grant And Loan Program

**Project Evaluations and Funding Recommendations
for the
2000-2001 Biennium**

and

1998-99 Biennium Status Report

**Prepared by the
Montana
Department of Natural Resources
and Conservation**

January 1999

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List of Abbreviations

AUM	animal unit month
BMP	best management practice
BOD	biological oxygen demand
CARDD	Conservation and Resource Development Division
CD	conservation district
CDBG	Community Development Block Grant Program
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
Cfs	cubic feet per second
Co.	county
CST	Coal Severance Tax
DEQ	Montana Department of Environmental Quality
DFWP	Montana Department of Fish, Wildlife and Parks
DNRC	Montana Department of Natural Resources and Conservation
DOC	Montana Department of Commerce
DOT	Montana Department of Transportation
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
FY	Fiscal Year
FONSI	Finding of No Significant Impact
GIS	Geographic Information System
GWIC	Groundwater Information Center
HUD	Housing and Urban Development
I/I	inflow and infiltration
I/P	infiltration and percolation
LWQD	Local Water Quality District
MBMG	Montana Bureau of Mines and Geology
MCA	<i>Montana Code Annotated</i>
MCC	Montana Climate Center
MDA	Montana Department of Agriculture
MEPA	Montana Environmental Policy Act
MHI	Median Household Income
MRWS	Montana Rural Water Systems, Inc.
MSCA	Montana Salinity Control Association
MSU	Montana State University
MT	Montana
NPS	non-point source
NRCS	Natural Resources Conservation Service, U.S. Department of Agriculture
NRIS	Montana Natural Resource Information System
O&M	Operation and Maintenance
pH	measure of alkalinity
Psi	pounds per square inch
RC&D	Resource Conservation and Development Area
RD	Rural Development Program
RDGP	Reclamation and Development Grants Program
RIT	Resource Indemnity Trust
SCS	Soil Conservation Service (now NRCS)
SID	Special Improvement District
SMP	Specific Agriculture Chemical Groundwater Management Plan
SRF	State Revolving Fund

TMDL	Total Maximum Daily Load
TSEP	Treasure State Endowment Program
TSS	Total Suspended Solids
USBR	U.S. Bureau of Reclamation, Department of the Interior
USDA	U.S. Department of Agriculture
USFS	Forest Service, U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAPA	Western Area Power Administration
WCSIP	West Crane Sprinkler Irrigation Project
WRD	Water Resources Division, DNRC

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Introduction

The Renewable Resource Grant and Loan Program provides funding for projects that conserve, manage, develop, or protect the beneficial use of renewable resources. Governmental entities may apply to the program to obtain funding for resource-related projects. Past projects have included the construction of municipal water and sewer systems, irrigation system rehabilitation, reforestation, watershed restoration, resource studies, and engineering and feasibility studies for construction projects. Applications are due May 15 of each even-numbered year. Montana Department of Natural Resources and Conservation (DNRC) staff reviews and ranks proposals from public entities and then presents a list of projects recommended for funding to the legislature during the regular legislative session. Recommendations for the 1999 legislative session are contained in this report.

Private entities are also eligible for both grant and loan funding for water-related projects under the Renewable Resource Grant and Loan Program. Montana's constitution prohibits the legislature from appropriating funds directly to private entities. Therefore, selection of projects occurs under a different process that involves review by DNRC staff and final approval by DNRC's director. Loan applications from private entities may be submitted anytime during the biennium. Private grants for water resource development or improvements are limited to \$5,000 or 25% of the project's cost, whichever is less.

Chapter 1

The Renewable Resource Grant and Loan Program

Background

The former Renewable Resource Development Program was established by the legislature in 1975 to promote the development of our renewable resources. Funds generated by the use of non-renewable mineral resources were pledged toward the development of more sustainable resource-based industries. Only governmental entities were eligible to apply for funding. Funds were provided for planning, design, construction, or rehabilitation projects that conserved, managed, developed, or preserved land, water, fish, wildlife, recreation, and other renewable natural resources.

The former Water Development Program was established by the Montana legislature in 1981 to promote and advance the beneficial use of water, and to allow Montana's citizens full use of the state's water resources by providing grants and loans for water development projects and activities. Under the Water Development Program, both governmental entities and private persons were eligible to apply for funding.

In 1993, the Renewable Resource Development Program was combined with the Title 85 Water Development Program. DNRC's role under Title 85 was expanded to provide for DNRC's coordination of the development of the state's renewable resources. The Resource Development Bureau of DNRC thus assumed the responsibility of administering the Renewable Resource Grant and Loan Program as stipulated under Title 85, part 6, MCA. Changes in the law provided a minimum of \$2 million for Renewable Resource Grant and Loan Program public and private grants each biennium. With this action, the 53rd Legislature re-confirmed Montana's commitment to promote the conservation, management, development, and beneficial use of the state's water and other renewable natural resources. Combining the two programs streamlined program administration but did not change applicant and project eligibility criteria

Purpose

The purpose of the Renewable Resource Grant and Loan Program is to further the state's policies, set forth in title 85-1-101 MCA, regarding the conservation, development, and beneficial use of renewable resources. The goal of the program is to invest in renewable natural resource projects that will preserve for the citizens of Montana the economic and other benefits of the state's natural heritage.

Project & Applicant Eligibility

Grants and loans are available for projects that conserve, manage, develop, or protect the state's water, land, vegetation, fish, wildlife, recreation, and other renewable resources. The majority of projects funded under this program are water resource projects, but forestry, soil conservation, and solid waste projects have received funding in the past. Project funding is available for construction, research, design, demonstration, and planning. Watershed projects that protect and improve water quality, and projects that help plan for the future management and protection of water sources (such as groundwater assessment studies) have received funding in the past. Chapter 6 of this report provides more examples of previous public grant and projects funded by the legislature.

Governmental Entities

Grants and loans are available to governmental entities. These applicants include municipalities, counties, water and sewer districts, conservation districts, irrigation districts, state agencies, and universities. In 1997, the legislature expanded applicant eligibility to include tribal governments.

Applications for renewable resource projects are accepted by DNRC from governmental entities on May 15 of even-numbered years. Applications are reviewed and ranked by DNRC staff on the basis of established project ranking criteria. The department then makes funding recommendations to the director and to the governor's office. The governor has the authority to change department ranking and recommendations on the basis of policy considerations. Project recommendations are then submitted to the Long Range Planning Subcommittee. This committee performs the final project review and makes recommendations to the full legislature. The legislature makes individual appropriations to fund projects and stipulates any conditions for funding. Projects are then administered by DNRC according to the conditions set by law.

Loans to governmental entities must be secured with the borrower's bond. Loans will be made only to applicants that are structured to incur debt, have the capacity to incur additional debt, and are willing to enter into a bond purchase agreement with the state.

Private Entities

Funding is also available to private entities. These applicants include individuals, associations, partnerships, for-profit corporations, and not-for-profit corporations. Funding for private grant projects is limited. In 1997, the legislature appropriated \$100,000 for grants to private entities. By law, grant funding for a single project may not exceed 25% of the total estimated cost or \$5,000, whichever is less. Statute provides that grants and loans may be made to private entities for *water-related* projects that conserve, manage, use, develop, or preserve the state's water. Only water-related projects may be funded. They must have quantifiable benefits that will exceed costs. Projects must also provide public benefits in addition to any private benefits. Applicants must hold or be able to acquire all necessary lands other than public lands and interests in the lands and water rights necessary for the construction, operation, and maintenance of the project.

Private grant and loan applications are managed under a process separate from state and local government entities. Montana's constitution prohibits the legislature from appropriating funds to a private entity directly. Therefore, funds appropriated by the legislature are used to issue individual awards to private grantees. Criteria for the award of funds to private entities are specified in the law. Each application is reviewed and, based on statutory criteria, funding recommendations are made to DNRC's director. The director has final authority over grants to private entities.

Irrigation system improvement projects, such as the conversion from flood irrigation to sprinkler irrigation, are the most common type of projects funded through private loans. Projects to convert to gravity flow irrigation systems are another typical project. Loans have also been provided for the development and improvement of rural water supply systems. Chapter 4 of this report provides more examples of previously funded private loan projects. Private loans must be secured with real property. Projects that are not water-related or that are unable to provide real property to secure a loan have not been funded. Irrigation water users associations have applied for loans in the past but have not qualified for funding because the association had no common property that could be offered as security.

Loans are made only to private applicants that are credit worthy and that are able and willing to enter into a contract for loan repayment.

Emergency Grants

Statute allows DNRC to request up to 10% of the funds available for grants in a biennium to use for emergency grants. DNRC may provide grant funds for up to \$30,000 for a total of \$125,000 to governmental entities to resolve water-related emergencies. Emergency funds may be granted for projects which if delayed until the next regular legislative session would result in substantial damages or legal liability. Requests for emergency funds are reviewed by DNRC staff and approved by DNRC's director. Chapter 5 of this report provides information about the applications for emergency assistance received in 1997 and 1998.

Funding Limitations

The law does not impose specific limitations on the amount of grant funding that the legislature may provide for renewable resource projects proposed by governmental entities. Grant recommendations presented to the Long Range Planning Subcommittee by DNRC are for limited amounts. These limits are consistent with limits imposed by the legislature in the past and have been imposed to obtain optimal public benefit from the investment of public funds. Guidelines used to develop funding recommendations have been developed with input from the Long Range Planning Subcommittee. Proposed funding levels do not constrain the legislature's ability to appropriate grants and loans in amounts deemed appropriate based on testimony presented in legislative hearings and consistent with current legislative priorities.

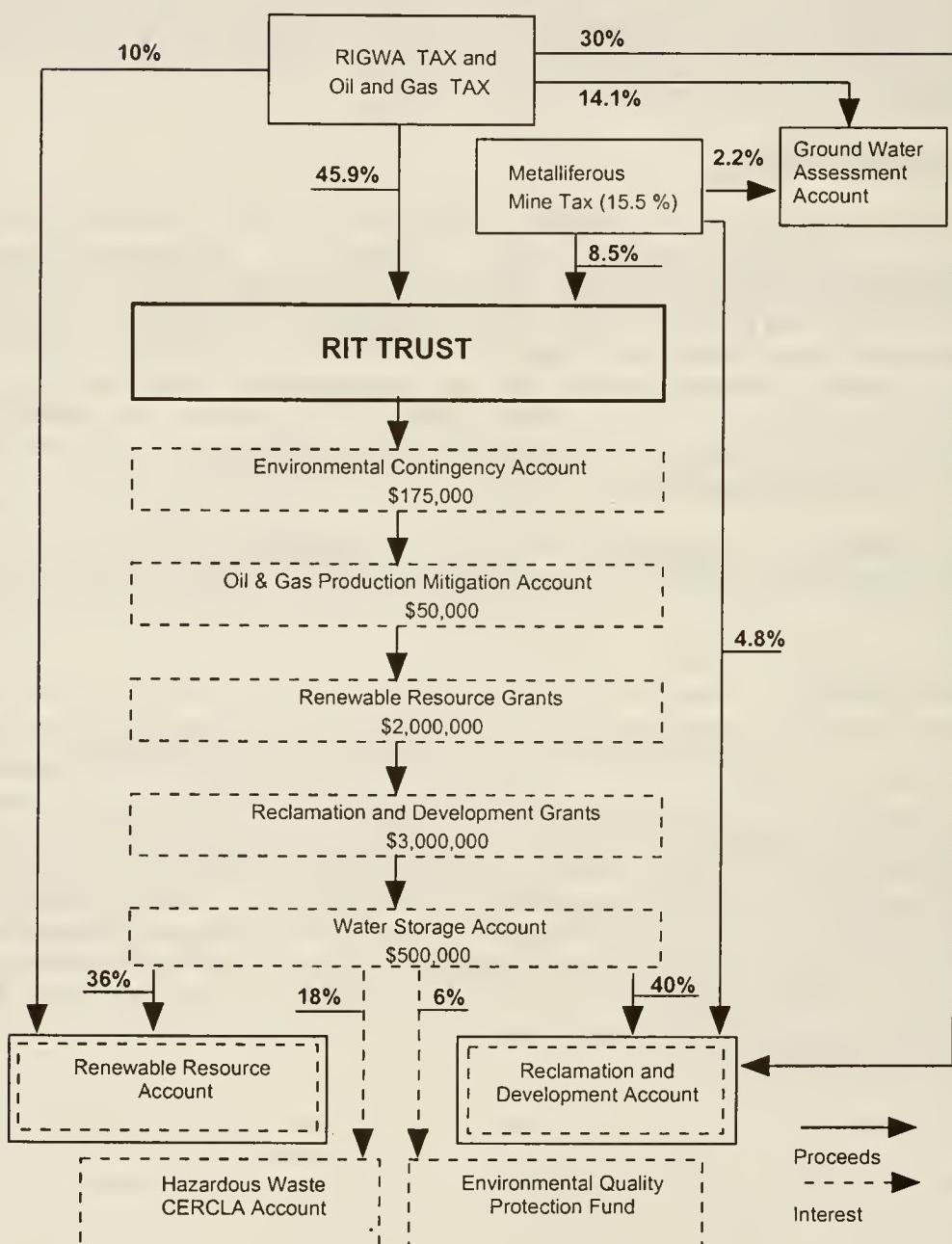
Grants to private entities are limited by law to 25% of the project cost. Loans to private entities may not exceed the lesser of \$200,000 or 80% of the fair market value of the security given for the project.

Funding Authority

A minimum of \$2 million for grants under the program each biennium comes from interest earned on the Resource Indemnity Trust (RIT). As shown in Figure 1, a portion of the interest earned on the investment of RIT funds is allocated by the legislature to each of five priorities, including: (1) the environmental contingency account (\$175,000); (2) the oil & gas production damage mitigation account (\$50,000); (3) renewable resource grants (\$2 million); (4) reclamation and development grants (\$3 million); and (5) the water storage account (\$500,000). After the allocation of funds to the five priorities indicated, the remaining interest earnings are distributed proportionately to four state special revenue accounts: (1) the Renewable Resource Grant and Loan Program account (36%); (2) the Reclamation and Development Grants Program account (40%); (3) the Hazardous Waste/CERCLA account (18%); and (4) the Environmental Quality Protection Fund State Special Revenue account (6%).

Figure 1

ALLOCATION OF RIT PROCEEDS AND INTEREST



Program Implementation

Part 6 of Title 85 specifies DNRC's role in the management of the Renewable Resource Grant and Loan Program. 85-1-605, MCA, allows DNRC to make project funding recommendations only. The legislature approves by appropriation the actual awards of those grants and loans to governmental entities that it finds consistent with the policies and purposes of the program. In presenting recommendations to the legislature, DNRC provides information about each project for legislative consideration. All public grant projects are ranked by DNRC to show the legislature the potential value of a given project compared to all of the other grant projects requesting funds. Grant projects that do not meet minimum technical and financial standards are not recommended by DNRC for funding. All recommendations made by DNRC may be rejected by the legislature in favor of other considerations that it holds as higher priorities. Once the legislature makes an award, DNRC manages the authorized grants and loans according to conditions set out in DNRC's report to the legislature and in the legislative appropriations bill.

Acting within the limits of the authority provided by statute, DNRC provides the staffing necessary to administer state and local government assistance rendered under the Renewable Resource Grant and Loan Program. Each legislative session, members of the Long Range Planning Subcommittee review the funding recommendations provided by DNRC. In response, the committee provides DNRC direction for the future.

Statute clearly prescribes DNRC's role in the administration of grants and loans to private entities. 885-1-606-614, MCA, is specific with respect to the parameters for the award of these funds. DNRC is directed to publicize statutes and rules governing these grants and loans and to set application deadlines. Only water-related projects are eligible. Additional eligibility criteria and the criteria used for project evaluation are set out in 885-1-609 and 610, MCA.

Rule Making Authority

DNRC's role of administering the Renewable Resource Grant and Loan Program is limited to a coordinating role. Limited by its authority to adopt rules, DNRC is not able to expand or limit the mission of the Renewable Resource Grant and Loan Program beyond legislative intent. DNRC does not have the authority to limit the amount of public grants or to narrow the range of eligible grants based on DNRC priorities. Title 85, MCA, directs DNRC to adopt rules that prescribe the application fee and content for grant and loan applications. DNRC also determines the ranking criteria used to evaluate and prioritize public grant applications and the process for awarding grants and loans to private entities according to statutory criteria. DNRC authority provides for the servicing of loans and determination of the terms and conditions for making grants and loans.

Program Goals

DNRC's goals for administering the Renewable Resource Grant and Loan Program are carried out through the solicitation of applications; the evaluation of applications to provide the legislature with a basis for the selection of projects that best supports the purposes and stipulations of Title 85, MCA; and the administration of grants and loans to comply with the conditions of the authorization and applicable laws.

DNRC seeks to:

- (1) inform the public and private sectors that grant and loan funding for water and other renewable resource projects is available, that certain applicant eligibility criteria for obtaining

funds exist, and that projects that meet the purposes of Title 85, MCA, qualify for funding. To promote the program, DNRC provides specific information;

- a. about the grant and loan program to state and local government entities that are most likely to sponsor projects eligible for funding. Information is provided through press releases, news articles, brochures mailed directly to potential applicants, and at workshops held in communities across the state.
 - b. to targeted private entities to obtain applications for grant funds that will result in significant public benefit. Information is provided through press releases, news articles, and direct contact.
- (2) coordinate with other state and federal agencies to provide information about government funding sources for water and other renewable resource projects, to facilitate a uniform application process, and to award funds without duplication.
- (3) solicit public comment and suggestions for improvements to the program through the administrative rule making and legislative processes, during the solicitation for grant applications, and throughout the review of projects for funding.
- (4) evaluate grant projects on the basis of technical merit and the resource benefits established in statute.
- (5) effectively administer grants and loans to ensure that funds are used for allowable costs and that projects are executed in accordance with any conditions set by the legislature and in compliance with Title 85, MCA, and other applicable laws without undue burden to the recipient.
- (6) offer loans at the most affordable rates available through the sale of public bonds.
- (7) adequately secure loans to protect the investment of public funds.
- (8) advise the legislature concerning DNRC's efforts to effectively administer the program according to statute and legislative intent.

Chapter 2

Renewable Resource Grants to Public Entities

Application Administration and Project Review Procedures

DNRC's Resource Development Bureau accepts applications for public grants and loans that are submitted or postmarked by May 15 of each even-numbered year. A \$250 application fee is required with each application. Exceptions are made for organizations that also provide voluntary expert review of DNRC grant applications. Those state agencies and units of the university system or other organizations that contribute to DNRC's extensive grant review process may request an application fee waiver.

Project Solicitation

Project applications are solicited broadly because DNRC seeks to maintain the competitive nature of the program. Those projects that most closely meet statutory priorities rank the highest and are most likely to rank above the cut-off point for available funding. Projects that do not rank competitively and fall below the projected funding line are less likely to receive legislative approval.

An extensive mailing list is used to promote the program and to solicit applications from eligible applicants. Mailing lists are obtained from divisions within DNRC and other state agencies. Included are contacts from the university system, state agencies, municipalities, environmental organizations, water users associations, irrigation districts, water and sewer districts, Native American leaders, conservation districts, and federal agencies.

To begin promotion for the 1998 application cycle, press releases were issued to announce the application deadline. Press releases were sent to all Montana daily newspapers during December 1997. Press releases provide general program information, a telephone number and address to request more information, application forms, and guidelines.

In addition to direct mail and media announcements, DNRC combines forces with other state agencies to meet locally with potential applicants. Information about a variety of state and federal funding programs is presented collectively at public seminars for Montana's state and local government financial assistance programs.

1998 saw a substantial increase in grant and loan applications from the previous biennium. In 1998, 750 grant and loan applications were distributed to potential applicants through direct mailing and hand-outs at financial assistance seminars. In the previous cycle, 52 applicants requested \$4.7 million in grant funding. Applications for this cycle increased to 62 grant applications requesting \$6.9 million in grant funding. Seven applicants also submitted applications for loan funding. Total loan funds requested were \$7,030,167. This amount represents a fourfold increase from the 1996 grant and loan cycle.

The increase in the number of applications may be attributed to a variety of factors. Federal funding has continued to decrease and a growing pool of applicants is chasing an ever-decreasing pool of grant funds. The increase in grant applicants may in part be the result of a more streamlined grant application process. The grant and loan application for the Renewable Resource Grant and Loan Program was trimmed from 60 pages in 1994 to 36 pages for the current cycle. Furthermore, the

program now shares common forms with the Treasure State Endowment Program and the Community Development Block Grant Program for five of seven sections of the application.

Information requested in the 1998 application included:

- a proposal abstract that provides a general description and outlines the project's merits.
- a technical narrative to describe the proposal's purpose, project history, and a description of prior efforts. Specific goals and objectives are provided as well as a discussion of project alternatives. Technical documentation is requested to support the technical narrative.
- a financial narrative and budget forms that describe the project's funding structure.
- affordability data are used to evaluate the local financial commitment and ability to pay of applicants that have the potential to generate revenue through fees or taxes.
- a project management plan that outlines the steps that will be made to ensure successful project implementation.
- a discussion of the public and natural resource benefits achieved by the proposed project.
- an environmental checklist that provides information necessary to assess the extent of any adverse environmental impacts that may occur as a result of the project.

Application Review

All applications received by the deadline are evaluated for completeness. Those missing documentation, the application fee, or other basic requirements are notified and provided time to submit additional material. Applications are then distributed to a team of key reviewers for evaluation. Figure 2 shows the flow of the grant application review and ranking process.

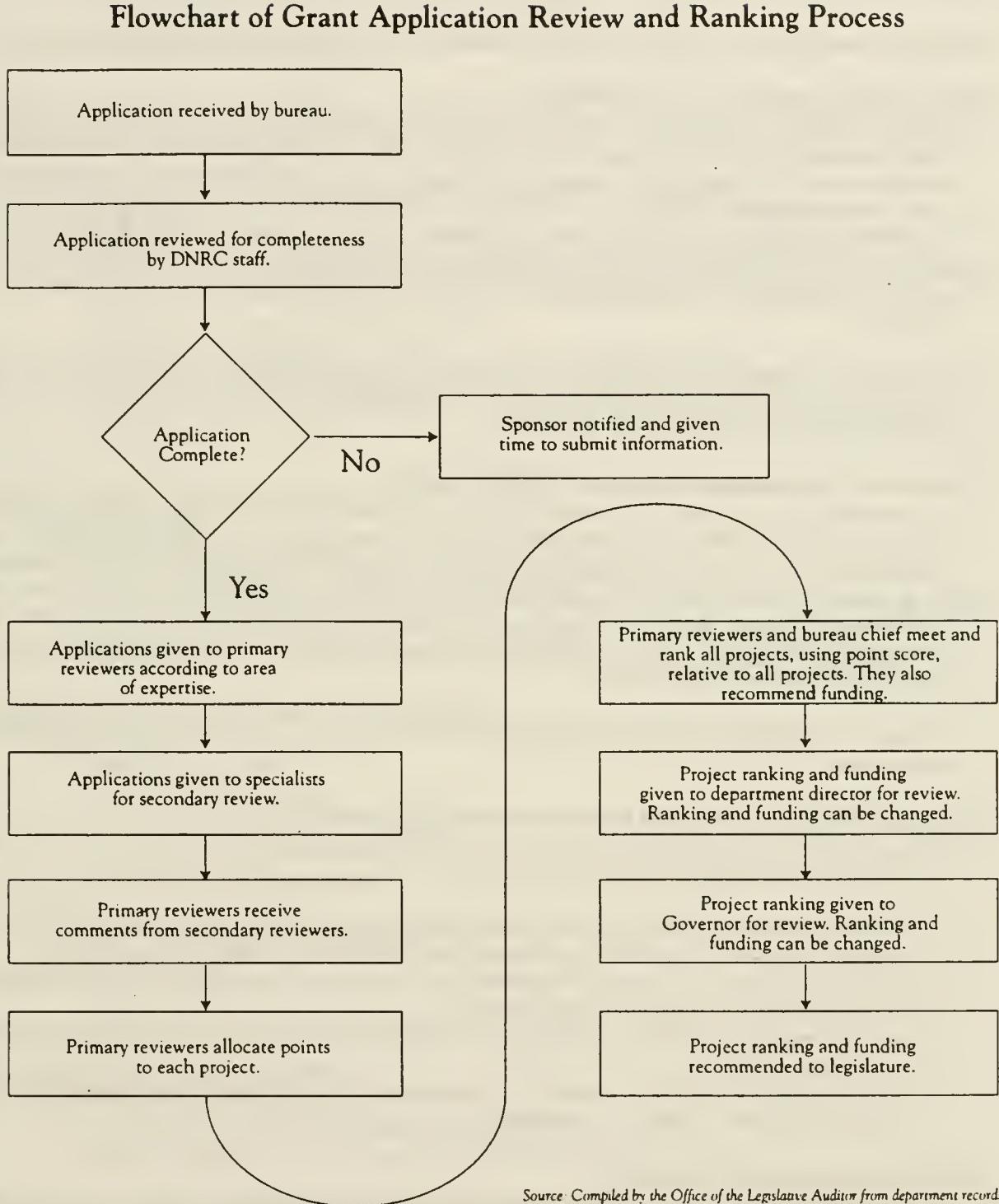
To evaluate applications for the 1998 cycle, DNRC assembled a technical review team of 11 key reviewers. Key reviewers include DNRC staff and contracted private consultants. On average, each key reviewer was asked to coordinate the review of five projects. Projects are assigned to reviewers based on the reviewer's area of expertise. Key reviewers are provided information about the program, application materials, and guidelines for reviewing applications.

DNRC's technical review team evaluates each application to ensure that the proposal is technically and financially feasible. During project review, additional detailed technical and financial information may be requested if necessary. With the results of their own evaluations and comments from agencies and outside experts, key reviewers assess and document the merits of each proposal based on standard review criteria outlined in the ranking form.

Each project is evaluated for the potential to cause adverse environmental impacts. In the event that long-term environmental impacts could occur as a result of the project, contingencies are attached to the funding recommendations to minimize impacts and to ensure that appropriate steps are taken to protect the environment.

State law requires DNRC to solicit views of interested and affected parties, including local, state, and federal agencies, concerning projects submitted for grant and loan funding. State agencies, federal agencies, environmental groups, private organizations, and universities are solicited for input during the technical review of applications. Guidelines, developed specifically for application review, are used to provide a consistent basis for reviewing applications. Press releases were issued in Montana's daily and weekly newspapers to also inform the general public of the projects seeking funding under the Renewable Resource Grant and Loan Program. No comments were received regarding any of the grant or loan applications.

Figure 2



Source: Compiled by the Office of the Legislative Auditor from department records.

Project Ranking Criteria

To obtain an objective evaluation of all applications, DNRC developed a standard ranking form containing review instructions and guidelines. Each key reviewer completes a ranking form for each application reviewed to document the merits of the proposal and the resulting score.

Each key reviewer assigns a score to reflect project merit under five primary categories:

(1) Financial Feasibility (-100 Points)

Financial feasibility is determined by DNRC's technical review team who evaluates the merits of similar proposals based on standard principles of finance. The reviewers determine whether the funds necessary to complete the project are available. They must also determine whether the project budget justifies project costs. Reviewers evaluate the security of the other funding sources that are necessary to complete the proposal; whether documentation of these funds is provided; whether the security required to support a loan requested in conjunction with the grant exists and is sufficient; and whether matching funds are in-kind contributions or another form of soft match.

If this review uncovers any deficiencies in a proposal's financial feasibility, points are deducted. An acceptable application loses no points, a marginal application loses 50 points, and a doubtful application loses the maximum of 100 points.

(2) Adverse Environmental Impact (-100 Points)

An environmental checklist is completed with the assistance and guidance of DNRC's environmental impact team. Each checklist item identifies adverse impacts in matters such as air quality, water quality, vegetation/wildlife, land use, and visual/aesthetics. If any adverse effects would result from a project, an environmental assessment and, possibly, an environmental impact statement must be prepared to fulfill requirements of the Montana Environmental Policy Act. The cost of these documents serves as a factor in reconsidering the initial cost and benefit assessment.

Adverse environmental impacts are estimated and could result in a proposal's loss of a maximum of 100 points.

(3) Project Management and Implementation (400 Points)

Each application is evaluated on the basis of the following criteria. Deficiencies in the project management plan will result in the loss of points.

- Has the applicant identified the staff necessary for successful project management?
- Is there adequate funding in the project budget to effectively manage the project?
- Could any hurdles in project management or coordination with public or private entities prevent successful project implementation?
- Has the applicant identified a strategy for integrating public input into project development and implementation?
- Has the applicant identified a strategy for managing consultants or contractors responsible for the completion of major project tasks?

(4) Technical Merit (400 Points)

Standard principles of engineering, research, and program development are used to evaluate a proposal's technical merit. Coordinating agencies must indicate that a project meets the standards and complies with state law. Applicants also must either hold or show the ability to

acquire all of the land and water right interests necessary to implement the proposal. Proposals that use commonly accepted technology and are not experimental efforts are more competitive than those that use a more experimental type of technology to solve a common problem. Proposal time lines must be reasonable and well documented. Up to 400 points are awarded to an application under the technical merit category.

(5) Public Benefit (600 Points)

Public benefit criteria are based on Montana statutes. Up to 600 points may be awarded, depending on the degree to which these tests apply.

A. Resource Conservation, Management, or Protection (200 points)

Will the project:

- result in a quantifiably significant contribution to resource conservation ?
- invest in replacing the use of nonrenewable resources with the use of renewable resources to provide benefits, economic or otherwise, for the state's citizens and to preserve Montana's natural heritage?
- preserve resources such as land, air, water, wildlife, or energy?
- develop a renewable natural resource to provide future economic benefits to Montanans?
- help to implement an ongoing program in support of renewable resource conservation and management?

B. Renewable Resource Enhancement (250 points)

Does the project:

- develop natural-resource-based recreation? (50 points)
- develop off-stream or tributary water storage? (50 points)
- improve water-use efficiency, including the installation of measuring devices? (50 points)
- advance farming practices that reduce agricultural chemical use? (50 points)
- support the development of state, tribal, or federal water projects? (50 points)

C. Citizen Benefits and Support (100 points)

Will the project:

- have multiple uses?
- be used by the public?
- serve an identifiable public interest?
- receive documented citizen support?
- provide new, permanent jobs?

Or, does the project provide benefits that:

- are measurable?
- will be ongoing?
- will affect a large number of people in Montana?

D. State Water Plan (50 points)

For example, does the project:

- implement a priority of the State Water Plan?
- support identified water storage priorities?

After each key reviewer determines the score for assigned projects, all of the key reviewers and the bureau chief meet to discuss the projects and scores proposed. During this process the key reviewer gives a short presentation about each project reviewed and the score given. After all the

projects are presented, the individual scores for each category on the scoring sheet are discussed. The team then decides the scores each project should receive in relation to all projects. Discussion by the team reduces inconsistencies between scores given by individual reviewers. Final team scores are recorded on a ranking spreadsheet used to document the ranking process.

DNRC's ranking system is used to determine the relative merit of every proposal submitted for grant funding. Ranking scores are used as a guide for the staff to select projects that best serve the program's objectives as stipulated by statute and to summarize information for DNRC's director. Proposal recommendations are presented to the Governor for grant funding in the order they are ranked by DNRC staff. Ranking scores are not binding. Either DNRC's director or the Governor may make any adjustments to the recommendations prepared by DNRC deemed necessary to reflect their assessment of natural resource and other policy priorities. Based on the Governor's priorities, an appropriations bill is drafted and introduced to the legislature. Actual funding decisions are made by the legislature. Not bound by DNRC's review criteria or the Governor's final ranking, the legislature ultimately will authorize funding for the projects in the order of priority and in the amounts that it judges will best serve the state.

Funding Recommendations

All feasible grant requests are ranked according to standard criteria to select those that most efficiently use the state's natural resources in accordance with statutory guidelines. Then, in conjunction with its recommendation for funding priority, DNRC makes its recommendations concerning the amount of funding to be awarded each project (Figure 3).

With the Governor's approval, final funding recommendations are presented to the legislature as part of this report. These recommendations do not impose any limit on the amount of funding the legislature may provide to any governmental entity for a single grant project.

Although grant funding for public projects is not limited by statute, in the past the legislature has limited its grant funding awards to a maximum of \$100,000 per project. This policy reflects the legislature's interest in providing funding for a large number of grants. This policy prompts the leveraging of additional grants, loans, and in-kind services and provides for a greater geographical distribution of limited grant funds.

Project Management

After an appropriations bill is enacted to authorize grants and loans, DNRC notifies the applicants of their funding status. Sponsors of funded projects are reminded that work on their projects may not begin prior to entering into a grant or loan agreement with DNRC. DNRC does not reimburse any project costs incurred before the legislative authorization is given or before a formal funding agreement is executed.

Project Monitoring

Procedures for monitoring projects are driven by a project grant contract agreement between DNRC and the project sponsor. The equivalent of two full-time staff administers the 40 or more active construction, planning, research, and public information grants.

Site visits are made to all municipal water and sewer projects in the construction phase and to approximately 50 % of all other projects. Site visits are made to spot check for problems or to respond to a request for assistance from the project sponsor. Budget and staffing constraints

preclude DNRC's site involvement at every project site.

Grant agreements, as with contract instruments used for DNRC's other state and federal grant programs, require quarterly progress reports, expenditure reports, and a final report. During a project's contract term, the project sponsor must submit quarterly reports to DNRC. These reports must reflect the percentage of the project completed, the project costs to date, any problems encountered, and the need for any agreement amendment. Projects are closely monitored each quarter when quarterly reports are submitted. Program staff document decisions and conversations that affect ongoing projects, make notes to the file, and document important conversations with correspondence. Amendments to grant agreements are prepared and issued in response to any problems that require changes to the project's scope, time line, or budget.

Project sponsors submit claims and obtain reimbursement of allowable costs from DNRC. Invoices may be submitted monthly, and all costs must be supported by an invoice or receipt. DNRC withholds payment of 10% of the grant amount until all contract requirements are met and the grant is closed.

Project Evaluation

Through its ongoing monitoring efforts, DNRC evaluates grants funded under the Renewable Resource Grant and Loan Program. Upon project completion, DNRC requires submission of a final project report to document project history and the quantifiable results of the expenditure of grant dollars. This report summarizes grant expenditures, documents the work accomplished, and compares project objectives as presented to the legislature with the final project results. Evaluation of the project through a final project report enables DNRC to measure how well the projects implement the program goals of developing, managing, and conserving Montana's renewable resources. Projects are considered successful if they complete the scope of work outlined in the grant agreement.

Figure 3

Funding Recommendations Fiscal Years 1999-2000

Rank	Applicant/Project Name	Recommended Grant Funding	Recommended Loan Funding
1	Milk River Project Water Users St. Mary Siphon Repair	\$100,000	
2	Malta Irrigation District Repair and Modification of Dodson Diversion Dam	100,000	\$2,274,950
3	Cascade County Conservation District Muddy Creek Restoration and Water Quality Improvement	77,000	
4	Broadwater Conservation District Slim Sam Riparian Area Implementation	7,522	
5	Madison County Harrison Wastewater System Improvements	100,000	
6	Glasgow Irrigation District Phase 1- Vandalia Diversion Dam Rehabilitation	56,000	
7	Petroleum County Conservation District Musselshell River Assessment and Monitoring Plan	50,150	
8	Mt Dept. of Natural Resources and Conservation Deadman's Basin Water Quality Improvement	100,000	409,700
9	Fort Shaw Irrigation District Water Quality and Quantity Improvement	50,000	
10	Sheridan County Conservation District Sheridan County Groundwater Management Program	99,700	
11	Cut Bank, City of Water System Improvements	100,000	
12	Buffalo Rapids Project Improving Pump Discharge Line Efficiency	91,622	
13	Mt Dept. of Natural Resources and Conservation Seepage Monitoring Program	100,000	
14	Sanders County Floodplain Delineation of the Clark Fork River	100,000	
15	Missoula, City of Sewer System East Reserve Street Phases II & III	100,000	
16	Park County Hydrogeological Reconnaissance of the Paradise Valley	95,000	
17	Glen Lake Irrigation District Costich Dam Improvements Project	100,000	
18	Denton, Town of Wastewater Treatment Project	100,000	

Rank	Applicant/Project Name	Recommended Grant Funding	Recommended Loan Funding
19	Bitterroot Irrigation District Water Conservation and Improvement	99,650	
20	Frenchtown Irrigation District Irrigation Water Use & Water Quality Improvements	32,900	
21	Boulder, Town of Water Systems Improvement	100,000	907,000
22	Daly Ditches Irrigation District Republican Canal Diversion Dam Replacement	100,000	730,691
23	West Crane Sprinkler Irrigation Project West Crane Irrigation Project	100,000	
24	Hebgen Basin/West Yellowstone Refuse District Composting Facility for Municipal Solid Waste	99,425	2,080,000
25	Teton County Conservation District Irrigation Methods & Pesticide Transport to Groundwater	100,000	
26	Elk Meadow Ranchettes County Water District Water System Improvements	100,000	
27	Glasgow, City of Combined Sewer Separation Project	100,000	
28	Columbia Falls, City of Sewer Treatment Plant Upgrade	100,000	
29	Mt Dept. of Natural Resources and Conservation Precipitation Relationships For Montana Design Guidelines	67,000	
30	Sweetgrass Community County Water/Sewer District Wastewater Treatment Facility Rehabilitation/Upgrade	100,000	
31	Sheridan, Town of Water Supply Improvements	30,000	
32	Corvallis County Sewer District Upgrade & Expansion of Wastewater Treatment Facility	100,000	
33	Geraldine, Town of Wastewater Improvements	50,000	
34	Roosevelt County Conservation District Fort Peck-Assiniboine and Sioux Rural Water Supply Project	82,109	
35	Brockton, Town of Water and Wastewater Systems Improvements	100,000	
36	Neihart, Town of Water Distribution Improvements	76,770	

Rank	Applicant/Project Name	Recommended Grant Funding	Recommended Loan Funding
37	Lewis & Clark County Water Quality Protection District Helena Area Groundwater Quality Monitoring Network	100,000	
38	Eureka, Town of Wastewater System Improvements	100,000	
39	Ekalaka, Town of Ekalaka Water Source Improvement	100,000	
40	Garfield County Conservation District Rehabilitation of Irrigation Diversion Dam & Outlet Works	100,000	
41	Drummond, Town of Sanitary Sewer Rehabilitation Project	100,000	
42	Lake County Conservation District Forestry Implementation Project	100,000	
43	Rae Water and Sewer District Wastewater Treatment System Improvements	100,000	
44	Canyon Creek Irrigation District Canyon Lake and Wyant Lake Restoration Project	100,000	227,000
45	Mt Dept. of Environmental Quality Direct Planning Grants to Small Communities in Need	100,000	
46	Chinook Division Irrigation Association Rehabilitation and Betterment of Water Conveyance Systems	100,000	
47	Mt Dept. of Natural Resources and Conservation Missouri Pipe Span Rehabilitation Project	100,000	409,426
48	Big Timber, City of Lagoon Reconstruction and Lining	\$100,000	
49	LaCasa Grande Estates Water and Sewer District New Water Supply System	100,000	
50	Missoula, City of Rattlesnake Creek Flood Plain Restoration & Control	74,000	
51	Eureka, Town of Water System Facility Plan	25,000	
52	Havre, City of Source-Water Delineation for Havre and Seeley Lake	20,000	
53	Troy, City of Water System Master Plan	23,646	
Total Funds Recommended		\$4,507,494	\$7,058,767
54	Sage Creek Water District "A - Closed" Watershed Classification	No Funding	

Rank	Applicant/Project Name	Recommended Grant Funding	Recommended Loan Funding
55	East Helena, City of Wastewater Treatment Facility Improvements	No Funding	
56	Homestead Acres County Water and Sewer District Water Systems Improvements	No Funding	
57	Tin Cup County Water and Sewer District Tin Cup Lake Dam Restoration Project	No Funding	
58	Willow Creek Sewer District Total Retention Lagoon System	No Funding	
59	Livingston, City of Yellowstone Street to Main Street Ditch Improvement	No Funding	
60	Lake County Class I Airshed Protection	No Funding	
Not Ranked	Park Conservation District Upper Yellowstone River Cumulative Effects Investigation	No Funding	
Not Ranked	Thompson Falls, City of Distribution System Improvements	No Funding	

Grant & Loan Application Evaluations

Project No. 1

Applicant Name: Milk River Project Water Users
Project Name: St. Mary Siphon Repair

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 33,000 Project Sponsor

Estimated Total Project Cost: \$ 133,000

Amount Recommended \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

The irrigation districts in the Chinook, Malta, and Glasgow divisions of the Milk River Project are requesting a Renewable Resource Grant from the State of Montana in the amount of \$100,000. The districts will match in part with \$33,000 of water user operation and maintenance assessment funds. The total project amount is \$133,000. These funds will be used to perform necessary repairs on the St. Mary Canal Siphon.

The eight districts applying for the Renewable Resource Grant serve a total of 110,306 project acres with 666 farms. The water from the St. Mary inter-basin transfer provides a stable water supply for Milk River Project Water Users, Bowdoin National Wildlife Refuge, Nelson and Fresno reservoirs, and municipal water supplies for the cities of Chinook, Havre, and Harlem. The reliability of the Milk River water supply is economically vital to agriculture and the communities within the Milk River Basin.

The Milk River irrigation districts have been working toward modernization, rehabilitation, repairs, and improvements to ensure reliability and reduce operational water losses in each of the respective districts. The districts are not subsidized by the U.S. Bureau of Reclamation (USBR). The districts pay a prorated share to USBR for project operation and maintenance. This has placed a financial strain on the districts' ability to repay. Currently there is no other funding available.

The need to repair the St. Mary siphon is imperative. Augmentation of the Milk River water supply is vital to agricultural based economy of the region. Delays will increase the cost of repairs or ultimately lead to failure of the structure.

Technical Assessment:

Project Background:

The proposed project consists of completing improvements to the St. Mary siphon, part of the inter-basin diversion facilities of the St. Mary Division of the Milk River Project. Improvements will address identified needs of the St. Mary siphons to maintain the existing level of service to the Milk River Project.

The St. Mary siphons deliver irrigation water to 666 farms comprising 110,306 acres throughout the

Milk River system, including Bowdoin National Wildlife Reservoir, Fresno Reservoir, and Nelson Reservoir. Numerous highline communities like Chinook, Havre, Harlem, and Glasgow draw water from the Milk River for drinking water supplies.

The St. Mary Diversion annually transports approximately 150,000 acre-feet of water from the St. Mary River drainage to the North Fork of the Milk River. Major maintenance repairs were completed in 1924, 1935-1937, 1940, 1954, and 1986. The existing water transfer system is currently in operable condition.

Technical Approach:

The primary goal of this project is to maintain existing services of the St. Mary Diversion and continue serving the agricultural, recreational, and community water supply needs in the Milk River Project area. The applicant has identified immediate needs necessary to ensure continued system service. Two new foundation supports are needed in areas where ground movement has occurred due to high groundwater levels in recent years. Two new expansion joints are recommended to alleviate stresses in the pipe system, and approximately 40 feet of 90-inch pipe is recommended for replacement due to pipe buckling. These needs are immediate and are necessary to prevent potential catastrophic failure of the siphons. Installation of a new cathodic protection system is also needed to protect the pipe from corrosion.

The applicants propose to complete the improvements during the 1999 construction season. The U.S. Bureau of Reclamation (USBR) will complete the design of the system improvements. USBR will also provide project management and provide crews to complete much of the work.

Project Management:

The project management team consisting of elected members of the Milk River irrigation districts, USBR, and the project engineer has been identified. The project management plan identifies specific duties for the team and includes management of consultants and contractors. USBR is familiar with public bidding and procurement statutes and will advertise and bid any outside services for this project accordingly. Wage and labor standards will be strictly enforced.

Financial Assessment:

RRGL Grant Costs

Labor	\$ 8,250
Materials	79,000
Contingency (10%)	9,975
Inflation factor (2.78%)	2,775
Total Grant Costs	\$ 100,000

Estimated Total Project Costs \$ 133,000 RRGL Grant Share = 75%

The identified cost of the project includes labor, materials, contingency, and inflation. Specific information on water user rates varies according to each of the seven individual irrigation districts served by the system. The water users pay approximately \$500,000 annually to USBR for operation and maintenance costs, or an average of \$4.53 per acre of agricultural land served by the system. This amount is reflected in the operation and maintenance costs of each one of the

seven districts.

Benefit Assessment:

Completion of improvements will allow continued operation of the St. Mary Diversion and Milk River Project at current levels. The project will directly benefit 666 irrigation district members. Benefits are immediate and long term. The project will also benefit the communities that obtain drinking water from the Milk River system, people that use the Milk River system for recreation, and fish and wildlife.

Environmental Evaluation:

This project will result in typical construction related short-term adverse environmental impacts that cannot be entirely avoided in any construction project. Construction impacts must be identified and mitigated to the extent possible. No long-term adverse environmental impacts are anticipated.

Funding Recommendation:

The Montana Department of Natural Resources and Conservation (DNRC) recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable Best Management Practices (BMPs) in the design and construction/execution of this project.

Project No. 2

Applicant Name: Malta Irrigation District

Project Name: Repair and Modification of Dodson Diversion Dam

Amount Requested: \$100,000 Grant
 2,274,950 Loan

Estimated Total Project Cost: \$ 2,374,950

Amount Recommended \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

The Malta Irrigation District is part of the Milk River Project and contains 42,493 irrigable acres. Water is supplied by a diversion dam on the Milk River at Dodson, Montana. The water is diverted from the dam into Dodson South and Dodson North canals. The Dodson South Canal feeds Bowdoin Refuge and ends up in Nelson Reservoir, which stores water for Malta and Glasgow irrigation districts. The Dodson North Canal supplies water for the Dodson and Malta irrigation districts.

The irrigation district was constructed during the years 1909 through 1923 and is an old project. The Dodson Diversion Dam has been in continuous service since 1911 with regular inspections and normal maintenance. Our objective is to repair or modify the Dodson Diversion Dam, which will

allow us to divert water early during spring run off. This will enable us to fill Nelson Reservoir before the piping plover, an endangered species, nests there in May or June. The water cannot rise during those months because the birds build their nests by the water's edge. With earlier diversions, we will have more water stored and will also supply water to Bowdoin Refuge. The refuge was established in 1936 for protection of migratory birds and other wildlife and has a contract with the U.S. Department of Interior for delivery of water. This fresh water delivery plays an important part in reducing the problem of selenium in Bowdoin Lake.

The present structures can hinder the earlier diversions because they do not allow ice to pass over the dam. New gate structures will allow ice to flow over them and would help bypass flood waters.

Dodson Diversion Dam serves a critical function in supplying water to the Malta and Dodson irrigation districts.

Technical Assessment:

Project Background:

Dodson diversion dam is located on the Milk River about 5 miles west of Dodson in Phillips County. USBR constructed the dam from 1909 to 1917 and started operation in 1911. USBR operated and maintained the diversion dam until 1941, when the Malta Irrigation District assumed the operation and maintenance of the structure. Dodson Dam is a 300-foot long rock and gravel-filled timber crib diversion structure with movable crest gates that are suspended from a steel truss bridge. The dam has concrete wing walls retaining an earth embankment on each abutment. A portable rail-mounted, engine-driven hoist travels over the steel truss bridge to operate the crest gates. The Dodson South Canal Headworks include 11 slide gates, which control about 500 cfs of water into the Dodson South Canal. The Dodson North Canal Headworks include four slide gates, which control about 200 cfs of water into the Dodson North Canal.

The Dodson diversion dam has been in service for about 90 years and is in need of repair and possible modification to maintain continued service. Funding from this grant would be used to perform a rehabilitation plan to identify measures to maintain the integrity of the dam. Preliminary design of the improvements would be completed to the extent that funding allows, starting in July 1999. The District has also submitted a loan application to proceed with final design and construction.

Technical Approach:

The goal of this project is to implement a rehabilitation plan to maintain the integrity of the Dodson Diversion Dam. The objective is to rehabilitate the various components of the diversion structure, including the crest gates, the bridge, and concrete to prevent failure and prolong the life of the structure. The district proposes to accomplish this in two phases. The first phase would be to assess the existing condition of the dam, develop rehabilitation alternatives, select the rehabilitation alternative, and prepare the preliminary design on the selected alternative. The second phase would be to prepare the final plans and specifications of the selected alternative, obtain review comments by USBR and DNRC, and then bid and award the construction to a qualified construction contractor.

The district plans to first assess the existing condition of the structure and evaluate rehabilitation alternatives in Phase I. The problems that have been identified include: corrosion of the steel crest gates, deterioration of the concrete abutment walls and north and south canal head gate structures,

scour damage to the downstream stilling basin, corrosion of the steel access bridge, and instability of the upstream timber crib dam face.

The district will hire a qualified consulting engineering firm to complete the Phase I study. Since the dam is part of the USBR Milk River Project, the study will be coordinated with USBR during the development of the rehabilitation plan

The anticipated improvements include: either replacing the steel crest gates with an inflatable rubber dam or constructing a concrete cap over the existing dam section and downstream apron to protect the rock-filled wood crib dam section. Deteriorated concrete abutment walls will be resurfaced with an epoxy-bonded concrete, and the existing steel superstructure will be repainted. Deteriorated concrete in the north and south inlet canal structures will be resurfaced with an epoxy-bonded concrete.

The technical approach for this project is appropriate. The diversion dam has exceeded its design life. The phased approach will give the district and USBR a means to determine the condition of the critical elements of the structure and evaluate an acceptable rehabilitation plan. The Phase I investigation should provide the required information to determine whether the project can be rehabilitated. The condition of the concrete and timbers is key in determining whether this structure can be repaired or should be replaced.

Project Management:

The Malta Irrigation District Project Manager will provide project management under the direction of the district board. The office staff will provide administrative support, bookkeeping, and accounting for this project. Project management should not be a difficult task since most of the large expenditures are for materials and contracted services. The engineering consultant hired for this project should have a long history of similar projects and successful project management. The consultant will be available to the district to answer questions and help facilitate all tasks identified in this grant proposal. The consultant will be required to submit written status reports, which can be used to compile reports to DNRC.

USBR employees will also help with project management, since they will be involved with the technical review of the project. They will be available to answer questions about project management and technical design.

Financial Assessment:

RRGL Grant Cost:

Professional (consultants) \$ 100,000

Total Grant Costs \$ 100,000

RRGL Loan Cost

Professional (consultants) \$ 288,090

Loan Fees 66,260

Construction Contract 1,600,500

Contingency (10%) 160,050

Inflation (2 yrs) 160,050

Total Loan Costs	\$ 2,274,950	
Estimated Total Project Costs	\$ 2,374,950	RRGL Grant Share 4% RRGL Loan Share 96%

The proposed funding sources include a \$100,000 DNRC grant and a \$2,274,950 DNRC loan. The district proposes to provide an undetermined amount of in-kind services to administer the feasibility study project and provide labor and materials for the rehabilitation project. A majority of the district's current budget of \$705,068.51 per year is used for system operation and maintenance. A portion of this revenue is raised by an annual assessment of \$12.20/acre on 42,486.96 acres plus \$2.75 per additional acre/foot. If the district approves this project, the projected annual assessment will increase to \$17.95/acre.

Benefit Assessment:

This project will ensure continued beneficial use of the district's water for irrigation purposes; preserve water rights; improve water management throughout the irrigation system; conserve water through better management and improved infrastructure; and improve operator safety with automatic crest gates. This project will benefit the public by maintaining recreation opportunities that include fishing, wildlife observing, and hunting within the project area; maintaining wildlife habitat for waterfowl, fish, and many other species; preserving or improving surface water quality; and maintaining water supply through water storage.

The district received letters of support for this project from the U.S. Fish and Wildlife Service (USFWS), Walleyes Unlimited, Montana Department of Fish, Wildlife and Parks (DFWP), Nelson Reservoir Recreation Association, and Glasgow Irrigation District.

Environmental Evaluation:

The feasibility study project will have no significant, long-term, adverse environmental impacts as a result of the project. There should be no long-term adverse environmental impacts associated with the feasibility study, since it is a study and only includes limited sampling. Since the structure is 90 years old, there is a potential for the rehabilitation construction to affect historical resources.

There would be some short-term environmental impacts if the project goes to rehabilitation construction. Temporary turbidity would impact surface water quality. However, the Milk River is a highly turbid stream naturally and no long-term impacts should be experienced. The applicant will be required to obtain the necessary permits from the U.S. Army Corps of Engineers and the DFWP.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000, and loan funding of the total amount requested, \$2,274,950. Grant and loan funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 3

Applicant Name: Cascade County Conservation District
Project Name: Muddy Creek Restoration and Water Quality Improvement

Amount Requested: \$ 77,000 Grant

Other Funding Sources:	\$ 9,440	Project Sponsor
	32,720	Greenfields Irrigation District
	20,000	NRCS
	31,760	USBR
	4,800	NRCS & Volunteer
	12,500	EPA
	10,000	Landowners
	10,000	USGS

Estimated Total Project Cost: \$ 208,220

Amount Recommended \$ 77,000

Project Abstract: (Prepared and submitted by applicant.)

Muddy Creek has long been listed among the worst of Montana's water quality non-point source pollution problems. Muddy Creek picks up substantial runoff, primarily from the Greenfields Irrigation District. When combined with storm events and runoff from non-irrigated lands, the runoff contributes many times the natural flow, with heavy sediment loads from streambank erosion. The result is water quality problems in Muddy Creek and the Sun and Missouri rivers. In the past, 200,000 tons of sediment were deposited into the Sun and Missouri rivers annually. The sediments have a negative impact on aquatic life, fisheries, recreation, aesthetics, possible flooding, water treatment costs, and irrigation costs.

Due to an aggressive erosion control program over the last four years by the district, USBR, Natural Resources Conservation Service (NRCS), and many other players, the Muddy Creek erosion problem has improved substantially. With combined efforts to reduce irrigation return flows and stabilize streambanks, the sediment load has been reduced from 200,000 tons to approximately 40,000 tons annually. This project will complement existing erosion control projects being pursued on Muddy Creek. This is an action step, in contrast to the numerous studies conducted over the last 20 years.

The project will reduce the sediment load and erosion by another 50% through the continuation of erosion control measures, riparian enhancement, and an active monitoring program to document actual improvements. This will be accomplished by: 1) continued placement by the district of rock barbs at the remaining bad erosion locations identified by USBR, 2) installation of fencing, trees, matting, and native grasses to help stabilize banks and riparian sites; and 3) monitoring of progress through water surface profiles, cross-sectional surveys, aerial photogrammetry survey, photo points, and U.S. Geological Survey (USGS) gauging stations.

Technical Assessment:

Project Background:

Muddy Creek is a tributary to the lower Sun River, which enters the Missouri River near the City of Great Falls. This project is focused on lower Muddy Creek between the towns of Power and Vaughn.

The very serious sediment problems on Muddy Creek were intensely studied for more than 20 years before actual on-the-ground erosion control work was implemented in 1994. As a result of this recently completed work, suspended sediment loads to the Sun River have been reduced by roughly 80%, from 200,000 tons/year to 40,000 tons/year. The proposed project, which is a continuation of these efforts, would reduce sediment loading by another 50%, or 20,000 tons/year.

Technical Approach:

The applicant, along with a team of state and federal agencies, volunteers, and local landowners (the Muddy Creek Task Force), proposes to continue erosion control work at most of the remaining problem sites that have been identified and mapped by USBR. The primary streambank and channel stabilization structures that would be installed are "rock barbs." These structures are jetties that extend from the bank and angle down into the channel. Rock barbs essentially build streambanks and create bedding material for riparian vegetation by trapping bedload and suspended sediments. There are many other instream structures that could potentially be used to control streambank and channel erosion problems. However, given the proven effectiveness of rock barbs on Muddy Creek, it seems appropriate to continue using these structures during the phase of the project proposed in this application.

Streambanks will be further stabilized by planting cottonwoods and willows at sites where existing barbs have entrained suitable amounts of sediment. Steeper streambanks will be stabilized with matting prior to these plantings. Approximately 3,300 feet of streambank will be fenced to control grazing.

Stream discharge rates and suspended sediment concentrations will be monitored by USGS during this project, as they have been during the past several years at two locations: At Vaughn (1.3 miles upstream of the Sun River) and at Gordon (14.6 miles upstream of the Sun River). This data, along with stream cross-section surveys and aerial photographs, will be used to directly monitor the results of the construction efforts.

All necessary permits, including 124 (DFWP), 404 (U.S. Army Corps of Engineers), and 3A (Montana Department of Environmental Quality, DEQ), were previously obtained in conjunction with the instream work conducted from 1994 to 1997. Any needed permit extensions will be obtained prior to the start-up of the construction proposed under this project.

Project Management:

The project will be managed and administered by the coordinator of the Muddy Creek Task Force, with additional guidance provided by USBR and NRCS. The coordinator's position is, and will continue to be, funded by the U.S. Environmental Protection Agency (EPA) via a 319 grant.

Financial Assessment:

RRGL Grant Costs

Professional Construction	\$ 20,000
	57,000

Total Grant Costs	\$ 77,000
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Estimated Total Project Costs	\$ 208,220	RRGL Grant Share = 37%
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The professional costs for this project are \$10,000 for a 50-50 cost share with USGS to operate the two stream gauging stations, and \$10,000 for a 50-50 cost share with USBR to conduct the aerial surveys and mapping. The USGS costs are standard prices for its gauging stations, which were confirmed by a memo from Ron Shields of the agency's Helena office. The aerial survey costs are based on a similar survey that was conducted on Muddy Creek by USBR in 1995. The survey proposed for this project would be conducted in the year 2000.

Construction costs are \$20,000 for fuel to operate the Greenfield Irrigation District's dozer, trucks, excavator, and loader for 500 hours. This equates to an average of \$40/hour to operate this equipment, which is based upon work records from previous years. Actual costs will be billed to DNRC on a per gallon basis. An additional \$20,000 is requested for rock and hauling (1,333 tons at \$15/ton). The cost for fencing culverts, native seed, streambank matting, and trees is \$10,000. The remaining \$7,000 is a 10% contingency for unexpected construction and material costs. All matching funds and in-kind services in the application were secure and in place as of July 28, 1998. The project does not affect any user fees.

Benefit Assessment:

This project will provide direct, quantifiable improvements to the conservation, management, and protection of renewable resources, specifically water quality and soils. The sediment loads from Muddy Creek to the Sun River and the Missouri have serious impacts to water quality, adversely affecting water for irrigation and fisheries. The project will also help enhance water-based recreation by improving water clarity and the shoreline aesthetics of the reservoirs within the City of Great Falls, reducing the size of mud flats where the Sun River discharges into the reservoirs. Improvements in water-use efficiency are also an ongoing part of the Muddy Creek Task Force's overall plan for the watershed. The erosion control practices being implemented on Muddy Creek are continuing to serve as a model for similar problems in Montana and the nation. There is documented citizen support for this project. This construction/rehabilitation project fully supports the state water plan.

Environmental Evaluation:

This project does not have any long-term environmental impacts or any potential adverse impacts.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$77,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 4

Applicant Name: Broadwater Conservation District
Project Name: Slim Sam Riparian Area Implementation

Amount Requested: \$ 7,522 Grant

Other Funding Sources: \$ 2,255 Project Sponsor
3,030 South Crow Livestock Association
450 NRCS
32,160 USFS, Townsend Ranger District

Estimated Total Project Cost: \$ 45,417

Amount Recommended \$ 7,522

Project Abstract: (Prepared and submitted by applicant.)

The Broadwater Conservation District would like to submit this application for a Renewable Resource Grant to construct 2.75 miles of riparian fence, install two cattleguards, and install two associated water developments to water livestock outside the fenced corridor. Completion of this project will enhance the Slim Sam riparian area while increasing livestock use on adjacent grazing areas.

The South Crow allotment management plan was recently revised by the U.S. Forest Service (USFS). Riparian utilization standards were incorporated to restore riparian systems. Currently, livestock meet riparian utilization standards in Slim Sam Creek prior to meeting upland utilization standards. Fencing the riparian corridor will achieve better distribution in these adjacent uplands and provide proportionately more days of grazing

There are seven permittees who graze approximately 500 cow/calf pairs on the South Crow Allotment. These local Crow Creek Valley ranchers make up the South Crow Livestock Association, which will directly benefit from grant monies. An increase of grazing days will occur annually along with a sustainable long-term use on public land. The grant would also offset labor costs of fence construction and riding that they would normally incur as part of their allotment costs.

Additionally, proper riparian function will increase water holding capacity, production and diversity of native herbaceous vegetation, and bank stability. Wildlife habitat and aesthetic value will also improve. Erosion and sedimentation will decrease. There are 200 more downstream users in Crow Creek Valley and the upper Missouri River Valley, including agricultural producers and recreationists, who will also benefit.

The requested grant would cover costs for fence materials, water development material, and a portion of the construction labor. Broadwater Conservation District sponsors this project in partnership with the South Crow Livestock Association, NRCS, and USFS.

Technical Assessment:

Project Background:

This project developed out of recommendations derived from the Crow Creek environmental assessment completed by USFS as part of the Helena National Forest Plan and the Elkhorn Landscape Analysis. The project sponsor seeks to implement a grazing management strategy in the Crow Creek allotment through a combination of fencing, off-stream water development, and improved livestock distribution. Range analysis conducted by USFS revealed that riparian fencing, in addition to active management, was necessary to optimize grazing potential in the region. Cattle tend to gravitate to the riparian corridor. Forage utilization standards are met in this area long before the surrounding uplands have achieved the standard. Riparian fencing will enable the permittees to use upland forage without damaging resources in the riparian corridor. Since Slim Sam Creek is a main source of livestock water, water will need to be piped outside the fenced project area to each adjacent grazing area.

Technical Approach:

The Crow Creek environmental assessment looked at six alternatives for livestock management in the allotment, including a no-action alternative. This project would implement elements of the preferred alternative of this study. This alternative includes a combination of vegetative treatment, and livestock management through grazing and fencing. The Helena National Forest did not consider a no-grazing alternative.

The project includes fencing portions of Slim Sam Creek, off-stream water development, and installation of two cattleguards on a route that provides user access to the area. The fence will be constructed using metal posts and four strands of barbed wire. The water developments will consist of 200-pounds per square inch (psi) black pipe, 36-inch culvert head box, 750-gallon fiberglass stock water tanks, and miscellaneous plumbing. Cattleguards are a standard type that would permit two vehicles to cross simultaneously.

Expert technical review by forest and range management professionals suggests that the grazing management component of the proposal is integral to overall project success. A well-developed grazing management plan, endorsed by the Crow Creek Livestock Association, must be in place prior to project implementation.

Project Management:

The Broadwater Conservation District and USFS will provide grant contract administration. Grant expenditures will cover the costs of materials and labor for the fence, water developments, and the purchase of one cattle guard. USFS will provide one cattleguard and the labor for installation of both cattleguards. USFS, Crow Creek Livestock Association, and NRCS personnel will perform all engineering, surveying, and design.

Financial Assessment:

RRGL Grant Costs

Materials	\$ 3,038
Labor	2,000
Range Rider	1,800
Contingency	684

Total Grant Costs	\$ 7,522
Estimated Total Project Costs	\$ 45,417

RRGL Grant Share 17%

Project unit costs are in line with quotes from local contractors. The off-stream water developments will cost \$1,519 for materials and \$1,000 for labor. These costs were projected from similar projects completed in the area. Costs were verified through a direct comparison to costs for off-stream water developments constructed through past projects funded through this program. Project funding is in place with firm commitments from all funding sources.

This allotment provides grazing for the seven permittees that make up the South Crow Livestock Association. Grazing fees on the allotment contribute \$2,681.10, but only 25 % of these funds stay within the district for use on resource improvement projects. Fees on the allotment amount to \$1.35 per animal unit month (AUM). In addition to the grazing fees, permittees provide labor and some materials for range improvement projects.

Benefit Assessment:

Completion of the project will result in the long-term protection of a watershed that provides benefits to a wide range of forest users. Water quality, wildlife, fish, and recreation resources will improve while promoting appropriate livestock management strategies on the allotment. The project will improve the water-holding capacity in the watershed, which will benefit downstream users by extending flows longer into the summer. There is also a benefit to water quality through improved riparian function. Crow Creek is currently listed as a "Water Quality Limited Stream" by DEQ because of non-point source pollution. This project will help reduce the non-point source impacts on Crow Creek. The project significantly conserves, manages, and develops renewable resources.

Grazing impacts on watersheds has been identified as an issue of statewide concern and remains the subject of great controversy. This project has the support of a broad coalition including stock growers, wildlife agencies, environmental groups, legislators, and a variety of state and federal agencies.

Environmental Evaluation:

There are no significant adverse environmental impacts as a result of this project. There will be minimal disturbance associated with the installation of stream head boxes and fence construction. The project sponsor will need to secure a 124 Stream Preservation Permit (from DFWP) for the construction of head boxes. The Crow Creek environmental assessment determined that no endangered or threatened species will be affected by the project, and USFS will conduct a cultural and historical inventory prior to project development.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$7,522. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 5

Applicant Name: Madison County
Project Name: Harrison Wastewater System Improvements

Amount Requested: \$100,000 Grant

Other Funding Sources:

\$500,000	TSEP
300,000	DEQ
400,000	RD Grant
300,000	RD Loan

Estimated Total Project Cost: \$1,600,000

Amount Recommended \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - The unincorporated community of Harrison has requested that Madison County assist in addressing what is perceived as a serious problem with wastewater treatment and disposal. Wastewater treatment and disposal is presently accomplished in the community by use of individual onsite systems (septic tank/drainfields), rather than a central municipal system. The county has formed a water and sewer district in the Harrison area to deal with the problem.

Problem - The community of Harrison is situated near Willow Creek, with a groundwater table that rises to within 1 to 4 feet of the ground surface. This situation has caused some onsite treatment systems to fail. It is probably a good assumption that wastewater from systems that continue to function is probably not being adequately treated. Because of these problems, the Madison County Sanitarian has placed a moratorium on any proposed new onsite systems. Those wishing to repair or replace existing failed systems must receive a variance from the county commission. In addition, the local elementary school has been placed under a state order to improve or replace its current wastewater treatment system (multiple septic tanks and drainfields) or connect to a municipal system.

Proposed Solution -The proposed solution would involve abandoning the existing onsite septic tank/drainfield systems and replacing them with a conventional gravity (8-inch minimum diameter pipes with manholes) collection system. The collection system would flow to a lift station, at which point the sewage would be pumped to two facultative storage lagoons. The treated effluent would be discharged using spray irrigation in the summer months.

Technical Assessment:

Project Background:

The proposed project consists of developing a community wastewater collection, treatment, and disposal system for the community of Harrison in Madison County. The project will result in the elimination of the onsite treatment systems within the community

The community of Harrison is an unincorporated town consisting of 66 residential homes and 15 commercial/institutional entities. All wastewater generated within the community is treated and disposed of with onsite systems. The age of these systems varies from recently replaced systems

to some which may be 20 or more years old. Some of the older homes do not have drainfields at all, and discharge directly to local drainages. Some of the existing systems are in very poor shape. A majority of the existing residential lots are less than a half acre in size, and new septic tanks and drainfields cannot be installed while maintaining appropriate setbacks from domestic wells, property lines, etc. The existing method of wastewater management results in groundwater contamination. The school well and other local wells have experienced bacterial contamination. The contamination at the school has caused the Montana Food and Consumer Safety Bureau to issue an order requiring corrective action that includes septic system replacement or connection to a public system.

The county sanitarian has placed a moratorium on all new septic tanks and drainfields in the area and requires that a variance be pursued for all replacement systems. The moratorium effectively eliminates any opportunity for growth within Harrison and makes it extremely difficult and costly for current residents to replace their systems.

Technical Approach:

The goals of this project are to eliminate the discharge of all partially treated wastewater to the groundwater by designing and constructing a community collection and treatment system. To achieve this goal, a facility plan was developed which identified and evaluated myriad collection and treatment alternatives ranging from advanced mechanical systems with subsurface disposal to total retention systems. The recommended alternative is to install a conventional gravity collection system and lift station, with treatment consisting of facultative lagoons and land application. This system achieves a high level of treatment at a relatively low capital and operating cost. Furthermore, it has the benefit of putting an additional 13 acres of agricultural land into irrigated use.

The selected alternative would achieve compliance with all state and federal standards. The proposed schedule is to begin design of the facilities in 1999 and initiate construction in May 2000 with completion and start-up later that fall.

Project Management:

The elected officials of the district and the county will oversee the project. The project budget appears sufficient for appropriate project management and implementation. A professional administrative consultant (also the design consultant) will coordinate all work and has experience with other similar projects. The applicant has prepared a comprehensive facility plan in which the public had the opportunity to participate.

Financial Assessment:

RRGL Grant Costs

Construction	\$ 100,000
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Total Grant Costs	100,000
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Estimated Total Project Costs \$1,600,000 RRGL Grant Share 6.25%

The overall funding package looks adequate and the funding sources and budgets are clearly indicated. The project is the number one rated project in the state on the DEQ priority list for funding, indicating its urgency and the importance of the project.

While a complete funding package is proposed, commitments are not firm at this time. However,

there is a strong need for the project and a compelling case for funding by all agencies.

With the proposed funding package, the average monthly user charges will be approximately \$26.00. Since there currently is no community system, there are currently no monthly user rates. Department of Commerce (DOC) guidelines suggest that average annual sewer rates be at or greater than 90% of 0.8% of the Median Household Income (MHI). 90% of 0.8% of the MHI for Harrison (\$21,667) divided by twelve months is \$13.00 per month. The proposed average monthly rate is twice the minimum target rate.

Benefit Assessment:

The project will eliminate local groundwater contamination and contamination of local and downstream surface waters. Resource conservation will benefit by 6.4 million gallons/year of wastewater (currently discharged to the groundwater and causing degradation) being directly applied to agricultural land. Resource enhancement will result by avoiding the discharge of 9.1 million gallons/year of partially treated wastewater. Citizens will directly benefit through protection of their current source of potable water and elimination of the potential contact with partially treated wastewater in nearby drainage areas and Willow Creek.

The benefits of the project will be long term and will be quantified through continued groundwater monitoring and the measurement of reduced nitrate concentrations and bacterial levels. Public support for the project is significant. Voter approval created the district specifically to address the described problems. Several letters of support by state and county officials were included in the application.

Environmental Evaluation:

The environmental checklist submitted with the application was complete and comprehensive. This project will produce short-term adverse environmental impacts typical during utility construction. Mitigation measures are identified in the environmental evaluation and will be further developed during detailed design and enforced during construction.

The only long-term potential negative aspect is the opportunity for periodic odors from the lagoons. The project sponsor will include design features in the lagoon to allow for maximum mitigation of this potential negative aspect. While a specific site for the lagoons has yet to be selected, any impact to existing wetlands will be mitigated.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 6

Applicant Name: Glasgow Irrigation District
Project Name: Phase 1 - Vandalia Diversion Dam Rehabilitation

Amount Requested: \$56,000 Grant

Other Funding Sources: \$10,000 Project Sponsor

Estimated Total Project Cost: \$66,000

Amount Recommended \$56,000

Project Abstract: (Prepared and submitted by applicant.)

This proposal is for a grant to repair the Vandalia Diversion Dam. Constructed between 1913 and 1917, Vandalia Dam is the initial diversion structure for the Glasgow Irrigation District. After more than 80 years of continuous operation, the facility is in need of significant repair and rehabilitation. Phase I of the rehabilitation will be the repair of the canal inlet and tunnel.

The district includes approximately 106 operational farm units covering 18,011.47 acres. A rural population of approximately 591 people rely on project facilities for irrigation water delivery, and numerous others rely on the reservoir created by Vandalia Dam for irrigation pumping. The project facilities are the economic backbone of our agricultural community. The structural integrity and reliability of Vandalia Dam are key to the economic stability of the Vandalia, Tampico, Glasgow, and Nashua communities in northeastern Montana.

The district has aggressively worked toward modernization, rehabilitation, and repair of project facilities. The district completed a \$2.2 million federal Rehabilitation and Betterment loan project to repair and modernize the main conveyance system and a cost share grant with DNRC to replace 128 of the approximate 300 on-farm delivery diversion structures in the district. These loan and cost-share projects have caused a considerable financial strain on the district. With the R&B loan program, district taxpayers had to reduce their annual economic return in order for the district to meet its financial responsibilities.

The structural integrity of the dam, canal inlet, and tunnels are vital to delivery of water to the district. The district plans to initiate the repair of the canal inlet and tunnels (Phase I) in 1999/2000. Funds from this grant will supplement the effort. The district plans to pursue numerous grant sources to provide funding for future phases of the repair and rehabilitation.

Technical Assessment:

Project Background:

Vandalia Diversion Dam is the primary diversion structure for the Glasgow Irrigation District (GID). USBR constructed the Vandalia Diversion Dam from 1913 to 1917. The dam has been in continuous service since 1917.

Significant spalling and freeze-thaw deterioration has occurred on the concrete surfaces throughout the dam structure, canal inlet, and canal tunnels. The center wall of the canal inlet has lost a significant amount of concrete at the winter ice level. Due to the extensive deterioration throughout

the structure, GID contracted with an engineering firm to complete a comprehensive engineering analysis and rehabilitation plan. That study was completed using funds provided by the Renewable Resource Grant and Loan Program. This project implements specific recommendations from that study.

Technical Approach:

The goal of the project is to rehabilitate the canal inlet and canal tunnels of Vandalia Diversion Dam. This project (Phase I) is GID's first step toward complete rehabilitation of the dam. The canal tunnels are further down on the priority list established by the rehabilitation study. However, due to the proximity of the tunnels to the canal inlet, the most efficient approach is to complete repairs on the tunnel at the same time. Water losses from seepage around the canal gates will be controlled by replacement of the concrete around the canal gates.

The project consists of the removal of approximately 42 yards of loose material, removal of corroded steel and splicing with new reinforcing steel, surface preparation through water blasting, and concrete replacement with epoxy bonded concrete. At the time the concrete is poured, it will be sampled for testing to ensure that it meets the required USBR standards.

The recommendations for the rehabilitation of the Vandalia Diversion Dam include three alternatives. Alternative I is for the rehabilitation of the existing structure. Alternative II would rehabilitate the superstructure and replace the crest gates with new rubber dam crest gates. Alternative III is dam replacement. Alternative III was ruled out immediately due to the high cost, approximately \$10 million. GID has not determined whether to pursue Alternative I or II at this time, however, the canal inlet and tunnel repairs are necessary regardless of which of these alternatives is chosen.

The district will contact the appropriate agencies for permitting and licensing necessary to complete the project. The district has not determined if a 404 permit will be necessary from the U.S. Army Corps of Engineers. Repair and rehabilitation will require only minimal disturbance to streambanks and river channel. Repairs will not require construction of the cofferdam that was necessary to complete the rehabilitation study.

Project Management:

In consultation with USBR, the district will complete project management. GID has an excellent track record in the implementation and completion of several projects funded through the Renewable Resource Grant and Loan Program.

Financial Assessment:

RRGL Grant Costs

Materials	\$ 38,500
Engineering	7,500
Technical (testing)	1,500
Contingency 15%	6,900
Inflation Factor (3%)	1,600
Total Grant Costs	\$ 56,000

Estimated Total Project Costs \$ 66,000 RRGL Grant Share = 85%

The project sponsor will provide an unvalued contribution to cover the cost of project administration. DNRC typically prefers to see funds directly allocated to project administration. However, in view of the excellent track record of GID in administering RRGL projects, and the availability of full-time staff to undertake this work, DNRC is confident that project administration will be performed competently.

Unit costs for materials were provided by the rehabilitation study performed earlier this year. Costs were verified by local suppliers. A total of 15% was added for contingency due to the highly variable nature of rehabilitation work. Typically for construction projects, DNRC allows 10 % for contingency. The project sponsor will provide \$10,000 in matching contribution in the form of labor and equipment.

The district assesses fees based on land class. There are four classes, with fees ranging from \$18.01 per acre to \$16.21 per acre. Additional water is assessed at the rate of \$3.00 per acre for an additional acre-foot of water. Completion of the proposed project will have no effect on user fees.

Benefit Assessment:

Approximately 600 people living on 106 operational farms rely on the Vandalia Diversion Dam to provide water for approximately 18,000 acres. Additionally, numerous "river pumbers" rely on the reservoir created by the dam. The regional centers of Glasgow and Nashua rely primarily on agriculture and related activities for their livelihood. This project will improve efficiency at the Vandalia Dam through reduced leakage, though the applicant did not quantify the improvements in this area. Benefits to resource management that stem from the diversion dam are significant. This project, however, is meant to sustain current activities, and additional improvements in resource management are secondary to the overall project goals and objectives.

Since 1987, GID has expended approximately \$2.2 million on rehabilitation and betterment of the system. This project is a continuation of ongoing efforts to improve water management and conservation.

Environmental Evaluation:

Project implementation will not result in any long-term adverse environmental impacts. The district will coordinate with the U.S. Army Corps of Engineers and the DFWP for obtaining the necessary permits to complete the work. The district will also coordinate all rehabilitation work with the State Historical Preservation Office. This phase of the project is only a minor part of the activities necessary to rehabilitate the Vandalia Diversion Dam. As the rehabilitation process moves forward, the district will need to plan its rehabilitation efforts in association with the state and federal agencies that oversee the water, biological, and cultural resources that are affected by rehabilitation activities.

Funding Recommendation:

DNRC recommends grant funding of \$56,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, project budget, and after all matching funds necessary to complete the project are secured. The applicant shall conduct all activities associated with the project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and implementation of this project.

Project No. 7

Applicant Name: Petroleum County Conservation District
Project Name: Musselshell River Assessment and Monitoring Plan

Amount Requested: \$ 83,250 Grant

Other Funding Sources: \$ 3,900 Musselshell River Group (cash)
 3,000 Musselshell River Group (in-kind)
 4,000 NRCS Technical Assistance

Estimated Total Project Cost: \$ 94,150

Amount Recommended: \$ 50,150

Project Abstract: (Prepared and submitted by applicant.)

The Musselshell River Group is a locally led group of farmers and ranchers with common natural resource concerns. This group has decided to address their concerns through an Environmental Quality Incentive Program (EQIP) Priority Area Plan. The plan would call for: improving water quantity through irrigation efficiency on the existing irrigation systems; improving water quality by reducing tailwater return; and improving rangeland and riparian health through riparian fencing enclosures, off-stream water sources, better livestock distribution, and rotational grazing systems.

This project would require a baseline assessment of upland and riparian health and water quality total maximum daily loads (TMDLs) in the priority area. The assessment would be conducted by a riparian and wetland research team from the University of Montana. The baseline inventory data will be used for on-farm conservation planning. Cost-share funding for the conservation practices will be through the EQIP Priority Area Plan.

The second part of the project entails holding an irrigation water management workshop and installing flow meters and soil moisture measuring devices, and the use of salinity meters. The installation of measuring devices and use of salinity meters would further improve water-use efficiency. By holding a irrigation water management workshop, the irrigators concerned would have exposure to soil moisture monitoring techniques, the use of the measuring devices, and salinity meters.

DNRC has determined that the Musselshell River meets the criteria for designation as a chronically dewatered watercourse as codified in 85-1-250, MCA. Even though these people are at the lower end of the river, their efforts to become more use efficient will contribute to the conservation of water and lessening of sedimentation loads in the river.

Technical Assessment:

Project Background:

Twelve landowners joined to form the Musselshell River Group (MRG). As finances permitted, they have individually tried to improve irrigation efficiency by land-leveling and adopting more efficient irrigation methods. However, flood irrigation is still the dominant method used. The Musselshell

River basin issues of bank instability, de-watering, and rangeland renovation spurred the landowners to seek assistance from the Petroleum Conservation District and NRCS. MRG has applied for a USDA EQIP grant and matching funds from the landowners to set up an EQIP Priority Area and implement irrigation and grazing improvements and develop long-term grazing management plans. The priority area assessment and monitoring plan grant request from RRGL meets, in part, several required aspects of the EQIP grant, including water quality and rangeland improvement goals. The applicant intends to apply for a 319 grant to study water quality in the Musselshell to develop TMDL recommendations. The three grant projects work together to meet the expressed needs of MRG.

Technical Approach:

The goals of the project are to reduce irrigation water consumption and improve farm, range, and riparian health. The objectives are to reduce water consumption by installing flow meters at irrigation diversion points; monitor soil moisture to optimize timing of applications; monitor irrigation water salinity to prevent damaging applications; conduct a riparian and upland resource study to identify site specific riparian and range problems; determine baseline health conditions of riparian and range lands; and monitor three grazing management strategies on riparian and range health. The objectives would be achieved by conducting the riparian corridor health study; by metering water flow, irrigation water salinity, and field soil moisture; and by conducting a workshop on irrigation water management for the MRG.

The Montana Riparian and Wetland Research Program (MRWRP), a research arm of the University of Montana, would conduct the monitoring assessment portion of the project. NRCS would complete upland studies, provide technical assistance, and conduct the monitoring and meter installation workshop. Landowners would install and monitor the meters.

The MRWRP study would identify baseline riparian vegetation and streambank conditions and set up permanent monitoring transects to evaluate three livestock management techniques as BMPs for streambank stabilization and riparian habitat enhancement. The three practices are rotational grazing, riparian and pasture management by cross-fencing, and providing livestock watering options by constructing off-site facilities. A cost-benefit analysis of management techniques would be determined. Data would be analyzed to show the relationship between streambank condition or riparian health indicators and site conditions. Visual representations of stream reach characteristics would be provided using GIS.

Project Management:

The project can be completed in two years. If the RRGL grant is delayed, the project would be delayed a year or more. The resource study and installation of monitoring meters is not critically time-dependent. However, the applicant anticipates EQIP and landowner matching funds to develop grazing management plans and to set up the management techniques to be studied. These elements must be in place for the MRWRP resource study to proceed.

Coordination among the 12 landowners, NRCS, and MRWRP team would be achieved through meetings and public workshops with outreach to Petroleum and Garfield counties. MRG operates under the guidance of the Petroleum County CD. If the EQIP grant is funded, it requires five- to ten-year contracts for grazing management plans. Installation of facilities and equipment may require longer-term commitments depending on the nature of the activity.

The Petroleum County district conservationist would manage the grant and project, but the specifics

of project management were not discussed in-depth. Reviewers noted that a key management element missing is oversight of MRWRP team professional services, and that project specific indirect costs (communications, postage, etc.) were too low.

Financial Assessment:

RRGL Grant Costs

Administration	\$ 2,350
Professional Services	21,000
Travel	6,500
Supplies	2,500
Monitoring Equipment	13,200
Workshop	300
Contingency (10%)	4,300
Total Grant Costs	50,150

Estimated Total Project Costs \$ 94,150 RRGL Grant Share = 53%

DNRC recommends a reduction in grant funding of \$33,100, for a total grant of \$50,150. This amount was derived from the alternative budget presented in the project application. The applicant had proposed funding a graduate student for two years to complete the project. DNRC felt that the project does not warrant that kind of time commitment. This project can be completed by MRWRP staff or through a private consultant for substantially less funds. Furthermore, DNRC does not feel that the purchase of 12 salinity meters is warranted considering the size of the project. At the current funding level, the budget is adequate to fund 12 measuring devices, 12 moisture meters, and 4 salinity meters, which can be shared by the producers served through this project.

The in-kind funds to be supplied by the 12-member (farm/ranch family) MRG for monitoring devices and NRCS for technical support are reasonable. There are no concerns about the delivery of these funding sources. As discussed above, project administration costs are low.

The MRWRP study budget requires further clarification. The unit cost to inventory and monitor the river corridor was determined to be too high. The submittal should "flesh-out" the estimates used to arrive at field time, travel time and mileage, and other indirect project costs. This should be presented by subtask, including analysis and reporting over the two-year period. Equipment requirements should be justified and costs presented for each item. Labor rates should be fully disclosed; the University of Montana overhead allowance should not be included.

NRCS assistance, meter installation, and the workshop would occur as proposed. The applicant clarified other project costs.

Benefit Assessment:

Water consumption by MRG would be reduced by an estimated 5 to 10% just by improving irrigation water application decisions through metering water flows, salinity and soil moisture. Decreased pump water would save an estimated 15,800 kilowatts.

Grazing management improvements would restore range and riparian health. The monitoring results will be able to identify qualitative trends in improving streambank and channel stability and

riparian health, thereby reducing erosion, sedimentation, and continued decline in irrigation water quality. Managing the amount and quality of applied irrigation water will improve deteriorated soil conditions. In combination with grazing management changes, grass and forage production will also improve.

Environmental Evaluation:

No significant, long-term adverse impacts environmental impacts would occur.

Funding Recommendation:

DNRC recommends grant funding of \$50,150. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 8

Applicant Name: Montana Department of Natural Resources and Conservation

Project Name: Deadman's Basin Water Quality Improvement

Amount Requested: \$ 100,000 Grant
 401,100 Loan

Other Funding Sources: \$ 100,000 Project Sponsor

Estimated Total Project Cost: \$ 609,700

Amount Recommended: \$ 100,000 Grant
 \$ 409,700 Loan

Project Abstract: (Prepared and submitted by applicant.)

Deadman's Basin is a DNRC water storage project located 22 miles east of Harlowton in eastern Wheatland and western Golden Valley counties. This facility is operated and maintained by the Deadman's Basin Water Users Association. The project impounds 72,220 acre-feet of water and irrigates approximately 26,842 acres. Deadman's Basin releases water through two outlet canals; the Careless Creek Canal and the Barber Canal.

One of the major causes of water quality degradation in the lower Musselshell River is streambed erosion, and resulting sediment transport, in Careless Creek. In addition, extensive private property damage along Careless Creek has occurred as a result of the erosion. A study, completed in 1991 for the Lower Musselshell Conservation District ("Study of the Deadman's Basin Reservoir Careless Creek Release System," by Aquoneering, Laurel, MT) , determined that decreasing flow rates in the Careless Creek Canal would reduce erosion and sediment transport in Careless Creek. This action will significantly improve water quality and decrease property damage.

In order to satisfy contractual demands for irrigation water, decreased flow in the Careless Canal will be replaced by increasing flow in the Barber Canal. Increased flow in the Barber Canal will require canal rehabilitation and enlargement. This phase of the Deadman's Basin Water Quality

Improvement Project will include modification of existing structures and the canal. This will increase the current capacity of the Barber Canal from 200 cfs to 300 cfs. Peak discharges into Careless Canal can then be reduced to non-erosive levels.

DNRC is requesting a loan and grant combination totaling \$501,100.00 (estimated year 2001 dollars). This funding will be used to complete work detailed in the technical narrative.

Technical Assessment:

Project Background:

Erosion and sediment transport in Careless Creek have caused a significant cause of water quality degradation in the lower Musselshell River. Careless Creek is a natural streambed that conveys part of the water stored in Deadman's Basin to the Musselshell River for use downstream. Studies have determined that reducing the flows in Careless Creek to a maximum of 150 cfs will reduce the problem. In order to accomplish this, the capacity of the Barber Canal must be increased to make up for the reduced flows in Careless Creek. This project is to determine, design, and construct the necessary improvements to increase the capacity of the Barber Canal to 300 cfs.

Technical Approach:

The goal of this project is to improve water quality in the lower reaches of the Musselshell River while continuing to provide the needed flows to irrigators downstream from Deadman's Basin. Three reports lend credibility to the selected alternative that involves improvements to decrease the flows in Careless Creek and increase the capacity of the Barber Canal. Improvements include minor canal realignment, replacement and/or improvements to existing headgates and drops, bank and plunge pool riprap reinforcement, and the installation of an additional 72-inch diameter culvert across U.S. Highway 12.

The project includes engineering design and contract administration as well as actual construction. It is part of ongoing work to improve the water quality in the Musselshell River and to prevent further damage in and along Careless Creek and its floodplain.

Project Management:

As with Phase II of this project, which is being managed by the Water Resources Division's Water Projects Bureau, the project will be managed by DNRC engineers in cooperation with the Deadman's Basin Water Users Association, conservation districts, and NRCS. Actual design and construction will be advertised, awarded, and managed using typical contracting procedures for state projects.

Financial Assessment:

RRGL Grant Costs

Engineering	\$ 30,000
Construction	56,000
Construction Contingency	14,000
Total Grant Costs	\$ 100,000

RRGL Loan Costs

Engineering	\$ 68,800
Construction	283,500
Construction Contingency	57,400
Total Loan Costs	\$ 409,700

Estimated Total Project Costs \$ 618,300 RRGL Grant Share = 16%

The proposed budget is adequate to complete the project. Engineering fees, construction cost estimates, and construction contingencies are overstated 25 to 50% based on historic cost data and accepted unit cost estimates for similar earthwork construction. The budget for administrative costs does not include the loan origination fee or the funding of the loan reserve. These cost deficiencies total approximately \$35,000. The applicant should re-evaluate actual loan requirements during the design phase of the project.

This project is being funded by the RRGL funding package presented in this application and contributions by the Deadman's Basin Water Users Association. The association is currently charging its users \$5.00 per acre; this fee is adequate to meet the association's proposed contribution of \$108,600 and to meet debt service requirements. The user base consists of 150 operators on 26,842 irrigated acres. This project will not affect the current rate assessment for members served by the project.

Benefit Assessment:

This is a water development project designed to improve water quality in the lower Musselshell River. By allowing for lower flows in Careless Creek, erosion and sediment transport to the Musselshell River will be diminished. The project will protect water quality in the Musselshell River while still allowing for the flows necessary for downstream irrigators.

There will be multiple benefits produced by this project, including development of fish and other wildlife habitat, the protection of wetlands through water quality improvement, and the rehabilitation of the riparian area for 18 miles along Careless Creek.

Environmental Evaluation:

There will be short-term adverse construction impacts associated with this project including dust and noise. However, due to its remoteness, the impacts will be negligible. Long-term impacts will generally be beneficial, since water quality will be improved and further degradation of Careless Creek will diminish.

Funding Recommendation:

DNRC recommends grant funding of \$100,000 and loan funding as requested. The recommended interest rate is market, and the maximum recommended term for the loan is 20 years. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all-applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction of this project.

Project No. 9

Applicant Name: Fort Shaw Irrigation District
Project Name: Water Quality and Quantity Improvement

Amount Requested: \$ 78,650 Grant

Other Funding Sources: \$115,640 Project Sponsor
10,000 NRCS
2,400 Sun River Watershed Coordinator
5,400 USBR

Estimated Total Project Cost: \$ 212,090

Amount Recommend: \$ 50,000

Project Abstract: (Prepared and submitted by applicant.)

The Fort Shaw Irrigation District is the second largest irrigation project on the Sun River. The district distributes water to approximately 10,000 acres on 177 farms between Simms and Sun River. The irrigation project was originally completed in 1908, with minor upgrades completed in 1961. The aging system of 12 miles of canal and 89 miles of laterals is in dire need of repair to reduce significant water loss and water quality degradation. The impacts can be seen for miles, with losses of 10,000 acre-feet of water per year (54 % of the water removed from the Sun River by the district). The seeps also mean significant loss of productive land due to saline seeps and impacts for other uses on the Sun River from degraded return flows.

Starting in 1996, the district began an aggressive water quality and quantity improvement project. This included installation of a remote operated headgate, a lining program, and water conservation study. This project will move on to Phase II goals which are: (1) improve overall irrigation efficiency, (2) reduce loss of land from salinity, and (3) improve water quality and quantity in the Sun River from these improvements. Phase II will accomplish this by: 1) replacing irrigation turnouts to allow for effective monitoring of consumption, 2) installing flow monitoring devices on canals, and 3) continuing the ditch lining program to reduce the significant seep problem. These improvements will increase efficiency of the system, divert less water (allowing more water to remain in the Sun River), and improve water quality by reducing chemicals and salinity in the return flows.

The project will reduce water consumption and diversion from the Sun River by 20 acre-feet. Water quality improvements of 50 % should be achieved in the return flows. An active monitoring program to document actual improvements is in place.

Technical Assessment:

Project Background:

Fort Shaw Irrigation District is located 25 miles west of Great Falls. Water is diverted from the Sun River to irrigate approximately 10,000 acres. The irrigation district holds responsibility for operation and maintenance of all irrigation facilities.

A 1982 USBR study report identified a need for a program of canal lining and replacement of obsolete facilities within the irrigation district. The report indicated that the project was old and unlined canals and laterals and deteriorated facilities have resulted in excessive canal and lateral leakage, poor service to water users, high groundwater conditions, and high operation and maintenance costs. The proposal indicates the estimated system efficiency is 46 %; thus, the 54% of water loss results in saline seeps and water quality impacts to the Sun River from return flows.

Technical Approach:

The goals of the project are to improve overall irrigation efficiency, reduce loss of land from saline seeps, and to improve water quality in the Sun River. These goals will be accomplished through the continuation the district's canal lining project on approximately 2,000 feet of canal, the installation of three measuring devices at key locations, and the installation of ten turn-outs to better monitor individual water use.

Several reviewers expressed concern that the use of "real time" monitoring stations is excessive for the project, and that continuous "Stevens type" monitors would be equally effective for substantially less cost.

A project coordinator funded through an EPA 319 grant will assist with project oversight. The project sponsor will provide the equipment and labor to complete the project. USBR and the NRCS will provide technical expertise.

Project Management:

The district manager will oversee the project with guidance and additional oversight from USBR and NRCS. The irrigation district has worked with all of the entities involved in the project over the course of the last five years. Opportunities for public input are achieved through irrigation district meetings and through outreach with individual irrigators. Since none of the activities associated with the project are in the Sun River, it is not anticipated that any additional public input will be solicited for this project.

Financial Assessment:

RRGL Grant Costs

Materials	\$ 29,500
Labor	4,000
Construction	12,000
Contingency 10%	4,500
Total Grant Costs	\$ 50,000

Estimated Total Project Costs \$ 212,090 RRGL Grant Share = 24%

Unit costs for project materials and construction were developed from quotes from local contractors and based on past experience completing similar projects throughout the irrigation district. Materials for canal lining will cost \$3.50 per linear foot. Pre-cast turnouts will cost \$1,550 each.

The applicant has proposed to install "real-time" monitoring stations that would provide continuous flow data to the irrigation district office. This system would be very convenient, but these devices

cost substantially more than the conventional "Stevens-type" continuous gages that must be read on site. Conventional monitors would cost approximately \$12,000 for three monitors including installation versus \$38,000 for the "real-time" monitors proposed in the application. DNRC feels that in the interest of stretching limited grant dollars, this program should only provide funds for conventional monitors. If the district still wants the added convenience offered by more advanced technology, the district should bear that additional cost. Therefore the department has reduced the recommended grant amount to reflect the cost of the conventional equipment.

The Fort Shaw Irrigation District provides water to 177 users on approximately 10,000 acres. The current rate levied per acre is \$11.50 per acre per acre-foot. Additional units are levied at \$2.68 per acre per acre-foot. The district will assess a one-time fee of \$1.00 per acre in support of project funding in addition to fees currently assessed in support of rehabilitation and betterment activities.

Benefit Assessment:

The proposed project would provide conservation and management of water resources in the Sun River basin. Preservation and/or rehabilitation of water quality and soil resources should occur through water measurement, better control of water diverted at the headgates, and canal lining by reducing return flows and seepage. The assessment information could provide continued benefits in the basin if applied properly. Support from local entities is well documented. The project is part of the larger Sun River watershed effort.

Environmental Evaluation:

Some wetland resources will be adversely affected as a result of project implementation. However, improvements to water quality should offset impacts to these resources. An environmental assessment will be completed prior to conducting any activities that will affect wetland resources. A assessment to evaluate the project site for the presence of threatened or endangered species as well as cultural resources will be conducted prior to project implementation. Measures to lessen the impacts to wetland resources will be evaluated prior to project implementation.

Funding Recommendation:

DNRC recommends grant funding of \$50,000. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, project budget, and after all matching funds necessary to complete the project are secured. The applicant shall conduct all activities associated with the project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and implementation of this project.

The applicant shall evaluate impacts to wetland resources resulting from the project prior to project implementation. A plan that identifies measures to lessen impacts to wetland resources shall be submitted to DNRC prior to entering into a grant agreement to receive project funding.

Project No. 10

Applicant Name: Sheridan County Conservation District
Project Name: Sheridan County Groundwater Management Program

Amount Requested: \$ 99,700 Grant

Other Funding Sources: \$ 6,000 Project Sponsor
 75,000 USFWS
 51,050 MBMG

Estimated Total Project Cost: \$ 231,750

Amount Recommended: \$ 99,700

Project Abstract: (Prepared and submitted by applicant.)

The purpose of this project is to manage groundwater pumping from a large aquifer system in the eastern portion of Sheridan County. This will be accomplished by (1) carefully reviewing applications to use groundwater, (2) monitoring aquifer conditions, and (3) estimating how much water can be safely pumped from the aquifers without substantially affecting other water uses.

In December 1994, the Board of Natural Resources and Conservation reserved 15,479 acre-feet of water per year from the aquifers for the Sheridan County Conservation District. The district intends to use the water for irrigation. However, when the district's application for water was before the board, there were concerns that the proposed groundwater pumping could affect wetlands, especially those on the Medicine Lake National Wildlife Refuge. The board therefore stipulated that the conservation district can issue authorizations for the use of 5,809 acre-feet of the water. Then, a hearing will be held by DNRC to reassess the situation and determine whether the district should develop the remaining 9,670 acre-feet of water.

Since the conservation district received its water reservation, local farmers have expressed much interest in developing the water. In fact, the district already has received permit applications that, in total, approach the 5,809 acre-foot intermediate cap.

Sheridan County Conservation District is working in partnership with state and federal agencies to manage groundwater development, monitor water levels, and model the aquifer. It is the district's hope that, with the information gathered during this process, the partners will be able to come to a joint conclusion regarding how much water beyond the 5,809 acre-foot intermediate cap should be developed for irrigation. The funds requested by the district in this grant application will be used to work toward this end.

Technical Assessment:

Project Background:

The proposed study area is located in the eastern portion of Sheridan County. The study boundary follows the high-yield and relatively extensive shallow aquifer system formed from the ancestral Missouri River and glacial outwash. Currently, a water reservation is in place for the study area and has a maximum of 15,479 acre-feet of water that can be allocated by the Sheridan County Conservation District. The district and DNRC established an initial withdrawal cap of 5,809 acre-feet

of water. When the initial cap is reached, the district can no longer issue permits to new water users until a hearing is held by DNRC to determine if the remaining portion of the water reservation should be developed.

An evaluation of the groundwater resources in eastern Sheridan County is currently underway and is funded, in part, by a 1996 RRGL grant. The current RRGL proposal is an expansion of the ongoing groundwater study. Information from the study is used by the district to manage groundwater resources, allocate groundwater under the water reservation, and ensure an adequate supply water is available for agriculture use, residents, and interconnected sloughs and lakes that support wildlife. Since there are significant surface water resources in the project area, the U.S. Fish and Wildlife Service (USFWS) is involved in this project. The need for the project is based on; the need to: 1) expand the current study and characterize the complex and highly productive shallow aquifer system, 2) monitor aquifer conditions and impacts as the water reservation is allocated to new users, and 3) establish a comprehensive monitoring network to track water quality and availability.

The proposal emphasizes management and planning to allocate groundwater under the water reservation primarily for agricultural use. The application also describes the interconnected sloughs and lakes recharged by groundwater in the study area. This relationship could be better highlighted in the application because management of the water reservation protects these surface water systems, which has a direct benefit to wildlife and recreation.

Technical Approach:

The Sheridan County Conservation District seeks funds to assess groundwater resources in eastern Sheridan County. In general, this will be accomplished through ongoing water level monitoring, computer modeling, aquifer testing, installation of additional monitoring wells, and limited water quality sampling. The goal of the proposed project and overall program is to provide unbiased scientific information regarding the complex and extensive aquifer in eastern Sheridan County. In turn, the district can make informed decisions for allocating groundwater and protecting surface water and groundwater resources. The Montana Bureau of Mines and Geology (MBMG) will perform the technical activities under this proposal. These activities will include installation of 40 additional monitoring wells (for a total of 80 monitoring wells in the study area), logging lithologic conditions, measuring water levels in wells and selected surface water locations twice per week, conducting aquifer tests on new production wells installed in the study area, collecting water quality samples, and fine tuning an existing MODFLOW computer groundwater flow model based on information collected under this phase of the program. Continuous water level recorders will be installed on selected wells and on staff gauges installed at 30 surface water locations. After the computer model is refined, it will be used to access and predict impacts on groundwater resources from increased pumping and aquifer conditions.

Water quality samples will be collected from the new monitoring wells and analyzed at an offsite laboratory for common ion water chemistry. Generalized regional groundwater flow paths, including recharge and discharge areas, will be refined based on the water level elevation data collected from the monitoring well network, surface flows, hydrographs, and aquifer test data. Water quality data will also be used to examine the suitability of water for irrigation and to monitor aquifer quality trends. This project involves managing the groundwater resources associated with a water reservation by 1) characterizing baseline conditions of the high yield aquifer, 2) predicting impacts of increased groundwater use with a numerical computer model, 3) protecting groundwater and surface water resources based on water reservation withdrawal caps, and 4) using a monitoring network to track trends in water quality and availability.

The alternatives to this project presented by the district included not funding the proposed grant, partially funding the proposed grant, or to find an alternative source of funding for the project. These alternatives were viewed less desirable because the district needs the proposed data to advise DNRC on whether the water reservation should be expanded beyond 5,809 acre-feet. The data would also allow the district to effectively manage groundwater resources to protect groundwater availability and maintain water in sloughs, lakes, and wetlands. In addition, the district is unsure how long USFWS will continue to fund this project due to government downsizing. In general, a partial funding alternative is less desirable than the proposed project. A comprehensive study is preferred for groundwater management and planning purposes. It is anticipated that the proposed study will provide reliable, credible information for planning purposes. Past efforts completed by the district were successful and have produced useful information to begin managing groundwater resources. However, additional efforts are proposed to be able to continue to meet the district's needs. Based on the RRGL application and supplemental technical information provided by MBMG, the current efforts and proposed efforts, no additional recommendations are proposed for the project. Communication with other agencies, such as USGS, to exchange technical information and study design is one area that could be considered.

Project Management

Mr. Jon Rieten of MBMG, who has experience managing similar projects and has managed the 1996 RRGL effort, will manage the project. The district will help guide the project, ensure the data collection and reporting efforts are relevant to managing the water reservation, communicate and address USFWS concerns related to maintaining surface water levels for wildlife habitat, and administer the RRGL grant. Project implementation is estimated to last approximately two years.

Financial Assessment:

Total cost of the proposed project is \$231,750. The following table breaks out the major costs of the RRGL grant.

RRGL Grant Costs

Administration	\$ 10,000
Professional	50,000
Construction	13,200
Travel	7,500
Laboratory	3,000
Equipment, misc.	16,000
Total Grant Costs	\$ 99,700
Estimated Total Project Costs	\$ 231,750

Estimated Total Project Costs **\$ 231,750** RRGL Grant Share = 43%

Professional unit costs for this project are in line with typical costs for a comprehensive hydrogeologic and surface water study. Proposed drilling costs are relatively low--about \$330 per well assuming a total of 40 wells will be installed. It is assumed that the MBMG drill rig will be used to install the monitoring wells, all the wells are basic 2-inch PVC wells, and the wells will be relatively shallow construction. Using this approach, the proposed budget may be reasonable, although, there is no room for contingencies. Equipment purchases include aquifer testing equipment able to pump over 300 gallons per minute (\$12,000), and general study equipment such as staff gauges,

water level recorders, and supplies (\$4,000). One reviewer felt that equipment costs were high, and as an example stated that data loggers could be borrowed from DNRC for the aquifer tests instead of purchasing new equipment. Since other groups and DNRC may also need this equipment at similar times, scheduling conflicts could arise which may make sharing equipment less desirable even though it may save money.

Project funding is in place, with firm commitments from MBMG and Sheridan County. Matching funds from USFWS have been provided for this program since 1995, and are proposed to provide \$70,000 over the course of the two-year project. These funds have been reliable from year to year, and are passed directly to MBMG for the technical efforts completed under the program. USFWS dollars are awarded annually and might not be available in the future. In this case, the district proposes the RRGL funds would be focused on completing the proposed 40 monitoring wells, collecting water levels, and collecting water quality sampling as generalized in the application. Efforts associated with refining the MODFLOW model, conducting aquifer tests, analyzing aquifer test data, and selected additional drilling efforts would be postponed until an alternative funding source is identified. Management of groundwater resources is possible without the USFWS funding, although some technical elements would have to be downsized until an alternative funding source is identified.

Benefit Assessment:

The project will collect scientific data that are needed by Sheridan County Conservation District to manage groundwater and surface water resources, and plan groundwater use based on the water reservation, groundwater quality, and availability. The proposed project is an expansion of the ongoing project funded by a 1996 RRGL grant. There are several hundred residents in the study area, and between 22 to 76 agriculture operations would benefit from this proposal. About 4,700 residents in Sheridan County would also benefit based on increased farming and ranching. Groundwater is an essential source of irrigation water and drinking water. Protecting groundwater resources is therefore very important to residents and agricultural operations. In addition, wildlife and recreationists benefit from this proposal since the project mitigates water withdrawal impacts on lakes, sloughs, and wetlands, such as Medicine Lake Wildlife Refuge.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of activities associated with the project.

Funding Recommendation:

This grant will bring total RRGL grant funding for groundwater characterization and management in this area to \$208,652. The information collected in the proposed study must be sufficient to provide the necessary documentation of the potential effect of further groundwater withdrawals. The project sponsor needs to establish long-term funding sources for ongoing monitoring expenses since it is unlikely that additional funding will be available through the RRGL Program. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 11

Applicant Name: City of Cut Bank
Project Name: Water System Improvements

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 500,000 TSEP
2,587,000 SRF
22,500 Project Sponsor
24,500 Interim Loan

Estimated Total Project Cost: \$ 3,234,000

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Cut Bank's outdated water system is posing health and safety threats for the residents. The city currently receives water through three intake pipes in the bed of Cut Bank Creek. At least one of these pipes is plugged and one is broken in half, leaving only one pipe to collect water for the city. Occasionally, agricultural waste upstream from Cut Bank is washed into the creek and pollutes the city's source of water for as long as three days. The city has no raw water storage to provide uninterrupted clean water during these emergencies. One higher area of Cut Bank has undersized water lines, resulting in very low water pressure and nearly nonexistent fire flows during irrigation season. A 500,000-gallon water storage tank is rusting and the roof is in danger of collapsing. Many areas of town have severely deteriorated distribution lines.

The city council has committed to an aggressive plan for correcting the water problems. A project costing over \$3 million will construct a raw water reservoir, rehabilitate the intake system and treatment plant, construct a new concrete tank and rehabilitate the existing one, and rehabilitate the booster station and standpipes. The city has budgeted a capital improvements fund of \$93,000 per year to replace pump motors and water mains (500 linear feet per year). The city will secure a \$2.58 million loan to supplement Treasure State Endowment Program (TSEP) and DNRC funds. Rural Development and Community Development Block Grants (CDBG) are apparently not available to the city at this time due to a high 1990 median income, and less than 50 % low and moderate income. The result of this program will be water rates that are 208 % of the target rate set by the DOC as affordable, and a combined rate of \$66.14 or 171 % of the target rate. The city council feels that it has little choice but to proceed with the project, since delay will only increase costs, and the system will deteriorate further.

Technical Assessment:

Project Background:

The proposed project consists of improvements to the public water system for the City of Cut Bank. Proposed improvements will primarily address raw water storage needs, treatment plant deficiencies, finished water storage renovations, and delivery system upgrades.

The city water system is supplied by Cut Bank Creek. Water is drawn directly from the creek

through three intake structures and treated at the treatment plant located on the southwest bank of Cut Bank Creek. The treatment plant was constructed in 1950 and was upgraded in 1975. The treatment plant consists of a single-stage mechanical flocculator, two conventional settlement basins, and three multimedia high-rate filters.

Finished water storage consists of a 1 million gallon buried concrete tank constructed in 1935 and a 1 million gallon steel standpipe constructed in 1975. The standpipe serves the booster district and is supplied by a booster station that was constructed in 1962.

Technical Approach:

The primary goals of this project are to conserve water and reduce energy and treatment costs by constructing a raw water reservoir that allows the city to manage the intake of raw water. Drafting raw water from the reservoir during high stream turbidity periods will reduce the energy and filter back flushing requirements by avoiding treatment of the high turbidity waters. The city will also be able to avoid drawing water from Cut Bank Creek during periods when water quality is adversely affected by agricultural runoff.

The secondary goals of this project are to complete water distribution and storage system upgrades (to extend the life of system components) and to construct new water mains to improve system hydraulics and fire flow capabilities.

The existing water system is in operable condition. The engineering report identified supply, treatment, and distribution system needs to improve the system including construction of a raw water storage facility, upgrading the existing intake structures, construction of one new clarifier, upgrading the treatment plant controls, upgrading the treatment plant standby (emergency) power capability, upgrading the 1 million-gallon water storage tank, upgrading the 1 million-gallon standpipe storage tank, upgrading the existing booster station, and construction of a new water main in the upper pressure district.

Project Management:

The project management team proposed for this project consists of the mayor, city council, an administrative consultant who is responsible for administration of the various grants and loans, the superintendent of public works who is responsible for coordination between the various agencies, the engineer, and the city clerk who is responsible for financial management.

Financial Assessment:

RRGL Grant Costs

Professional Services	\$ 5,000
Construction	95,000
Total Grant Costs	\$ 100,000
Estimated Total Project Costs	\$ 3,234,000
	RRGL Grant Share = 3.1%

The estimated cost of the project includes administration, contingency, and an interim loan. The average residential user rates are currently \$31.82 per month and are projected to increase to

\$51.20 per month as a result of this project. The average residential wastewater rate is \$14.94 per month. The proposed combined average residential water and sewer rate will be \$66.14 per month. The current "target rate," based upon the median (1990) household income of \$23,378, is \$38.57 per month.

The budget includes \$35,000 for an administrative consultant, \$245,000 for engineering, \$115,000 for construction oversight, and \$230,000 (10%) for contingency. These figures are reasonable for a project of this scope.

Benefit Assessment:

Additional capacity for raw water storage will greatly improve the ability to provide safe drinking water to the citizens of Cut Bank. Construction of the off-stream storage will allow the city to store water for use during periods of exceptionally high and low flows. This will ensure that the city has the capability to provide sufficient water to the users irrespective of surface water conditions. Storage will also result in conservation of water and energy due to improved filter efficiency (resulting in less frequent filter back flushing) because the city will be able to draw on raw water storage when Cut Bank Creek water quality deteriorates due to high turbidity or organic loading levels.

The project will directly benefit 4,200 current users. These benefits are immediate and long-term. Renovations to the existing booster pump station, concrete storage tank, and steel standpipe are major maintenance items needed to extend the life of these components. Completion of the upper pressure district water main loop will improve fire flow and domestic service to the upper district.

Environmental Evaluation:

This project will result in typical construction related short-term adverse environmental impacts, which cannot be entirely avoided in any construction project. Construction impacts must be identified and mitigated to the extent possible. Mitigation efforts may include dust abatement procedures, traffic control procedures, de-watering system discharge plans, and load restrictions on public streets. No long-term adverse environmental impacts are anticipated.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 12

Applicant Name: Buffalo Rapids Project
Project Name: Improving Pump Discharge Line Efficiency

Amount Requested: \$ 91,622 Grant

Other Funding Sources: \$ 101,513 Project Sponsor

Estimated Total Project Cost: \$ 193,135

Amount Recommended: \$ 91,622

Project Abstract: (Prepared and submitted by applicant.)

The proposal area covers 25,380 acres of the 30,000 acres contained within the Buffalo Rapids Project located on 64 miles of the Yellowstone River in Eastern Montana. The goal of the project is to improve efficiency of the Terry Pump and discharge lines. The means to achieve this goal are to replace the first 450 feet of pump discharge line with 30-inch PVC pipe.

The primary concern with the Terry pumping plant is within the first 450 feet of the discharge line from the pump house. These lines persistently leak regardless of the remedial actions taken. The loss at the peak of the pumping season has been measured at 6.15 acre-feet per day.

This action will directly benefit Buffalo Rapids' 155 full-time and 27 part-time farmers. Buffalo Rapids is a significant portion of Custer, Dawson, and Prairie counties' economy. Additional benefits include increased instream flow and less electrical power consumed, which results in less carbon dioxide (CO₂) emissions and lessens the "greenhouse effect."

The project will be implemented by Buffalo Rapids personnel with their manager serving as the project manager and technical advisor for the project. The anticipated time of completion will be approximately two months. What is not completed in the fall of 1999 will be completed in the spring of 2000.

Buffalo Rapids has installed and repaired pipelines for the past 15 years and owns the necessary equipment. Its operators and personnel are experienced in such projects, having replaced the Fallon River pump discharge lines in 1993.

Estimated cost of the project is \$193,135, of which \$91,622 is being requested from the DNRC grant program. Buffalo Rapids will donate \$101,513 in labor, machine shop time, and heavy equipment.

Technical Assessment:

Project Background:

The Buffalo Rapids Project was constructed between 1940 and 1945 as a USBR project. The Buffalo Rapids Project Terry Pumping Plant is located approximately 2.5 miles west of Terry, Montana. Water is pumped from the Yellowstone River to irrigate part of the irrigation project's 25,380 acres.

Construction of the Terry Pumping Plant was finalized in 1945. Over the last 20 years, the three

discharge lines from the pumping plant have persistently leaked. The cast-in-place concrete pipe consists of 24-foot sections joined together by expansion joints. Deterioration of the joints due to age, along with cracks and displacement from ground frost, has caused the leakage. Application of chemical grout and encapsulation of leaking portions with concrete have failed to permanently stop the leakage. The proposal indicates that water loss due to this leakage is 3.1 cfs or 6.15 acre-feet per day based on measurements taken in 1997. The objective of the project is to eliminate all leakage from the discharge lines. This project is part of an overall goal of the irrigation project to increase water-use efficiency. Funds have been obtained from the USDA EQIP program for other water-use efficiency work on the Buffalo Rapids Project.

Technical Approach:

The project entails replacing the first 450 feet of each of the three discharge lines, including check valves and vacuum valves, and coating the remaining 1,225 feet of each line with polyurethane material. Visual inspection from crawling the inside of the lines has identified the first 450 feet of each line as needing replacement. The remaining 1,225 feet require coating only. The existing concrete pipe will be replaced with 30-inch PVC plastic irrigation pipe. Based on the alternative pipe materials discussed in the proposal; (i.e., concrete, steel, polyethylene), PVC was shown to be the least costly and most effective alternative. It is stated that the expected life of the pipe is 50+ years and the coating up to 30 years. All work will be performed by the irrigation project staff including project design and management by the Buffalo Rapids Irrigation Project manager. The staff has experience in installation of this pipe having worked on an identical project at another of the Buffalo Rapids Project pumping plants. USBR has reviewed the preliminary design. Project phases indicated are Phase I, planning and engineering; Phase II, preconstruction; Phase III, construction; Phase IV, evaluation. Construction will begin following the irrigation season (around October 1) and will last approximately two months.

Project Management:

The Buffalo Rapids project manager will perform project administration. This includes ordering materials, review of plans, transporting and distributing material to the site, day-to-day management of the project, and preparing all reports. The project manager will coordinate with the Western Area Power Administration (WAPA) regarding removal of an electrical distribution cabinet during construction. Compliance with the National Historic Preservation Act requirements will be coordinated with USBR and State Historical Preservation Officer as the site is located on a USBR easement. Overall, coordination with USBR will take place regarding the project.

Financial Assessment:

RRGL Grant Costs

Materials	\$ 83,293
Contingency	8,329

Total Grant Costs	\$ 91,622
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Estimated Total Project Costs	\$196,465	RRGL Grant Share = 47%
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The project sponsor will contribute \$5,932 for administration costs and \$95,581 for construction costs. USBR will contribute \$3,323 for professional/technical costs. Based on consultation with the pipe company, all material costs are reasonable and adequate. All other project costs appear

reasonable and adequate.

All matching funds/contributions are secured as construction equipment and staff will be provided by the project sponsor. It appears the project will have no effect on user fees as the project sponsor contribution will be funded from the existing rehabilitation fund. This fund is funded by a portion (\$2.16) of the existing water user fees (\$25 per acre for District I and \$29 per acre for District II.) The application indicates 182 water users will be affected by the project.

Benefit Assessment:

Long-term, quantifiable renewable resource benefits will be realized through water savings (less water diverted from the source) of 1,023 acre-feet per year, and 301,666 Kwh less energy used due to reduced pumping. The project will help to implement the Buffalo Rapids Project program of increased water-use efficiency and management of water for the water users.

Measurable public benefits indicated include more water available in the Yellowstone River, less energy use, and less air pollution. Support from a local entity and the local working group related to the USDA EQIP program priority area is documented.

Environmental Evaluation:

No long-term adverse environmental impacts should occur from the project. The applicant has completed a cultural and historic survey related to the project. It was submitted to the State Historical Preservation Officer in March 1998. Mitigation is to be completed by June 1, 1998, as related to the USDA EQIP program.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$91,622. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 13

Applicant Name: Montana Department of Natural Resources and Conservation
Project Name: Seepage Monitoring Program

Amount Requested: \$ 100,000 **Grant**

Other Funding Sources: \$ 34,290 **DNRC (In-kind)**

Estimated Total Project Cost: \$ 134,290

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

DNRC owns several reservoirs that have aging high-hazard dams. The term "high hazard" refers to the potential for loss of life below the dam, should the dam fail. One of the responsibilities of dam ownership is to have in place an adequate program to monitor seepage water at the dam.

The importance of controlling seepage through a dam was not known 50 years ago when many of DNRC's dams were originally built. Several of DNRC's dams do not have adequate seepage control systems. As a result, problems associated with seepage are starting to show up at several of DNRC's dams. There is no means in place to determine the severity of the seepage and whether the integrity of the dam is at stake.

The purpose of this project is to establish a seepage monitoring program for the high-hazard dams on four of the department's reservoirs. These dams were chosen due to surficial evidence that problems may be developing and/or a clear threat to public safety. The primary focus will be the installation of monitoring wells and piezometers in each dam. The funding in this request will be used primarily to contract with private drilling firms to install monitoring wells. The four reservoirs chosen are: (1) Deadman's Basin Reservoir (*Wheatland County*), (2) Nilan Reservoir (*Lewis & Clark County*), (3) Ruby Dam (*Madison County*), and (4) Cottonwood Dam (*Park County*). DNRC is requesting a grant in the amount of \$100,000 to implement these seepage monitoring programs. The total cost of the project is \$134,290. \$34,290 of the funds would come from in-kind services provided by the department and the water users.

Technical Assessment:

Project Background:

The proposed engineering evaluation consists of four state owned dams in west and central Montana. The dams are "high-hazard" dams because of the potential for loss of life if there is a dam failure. The four dams were included in the proposal based on field observations suggesting that problems may be developing which require monitoring and documentation in order to correct the problems. Specifically, DNRC determined that there is a need to characterize how water moves through the dams, determine the level of saturation, and provide a means for early detection of a potential problems or failure. The four state owned dams include Ruby Reservoir, Nilan Reservoir, Cottonwood Reservoir, and Deadman's Basin Reservoir.

The need for the proposed study is based on the lack of information available to assess current dam conditions, and field observations suggesting there may be dam safety problems. Lastly, the proposed study is needed to setup a monitoring network to track dam conditions overtime and determine if dam repairs are needed to avoid a dam failure.

Technical Approach:

DNRC seeks funds to evaluate hydraulic conditions at four dam sites. The proposed project will provide information from monitoring devices that will be used to determine if serious seepage or stability problems exist, and make these determinations before an emergency occurs and downstream residents are threatened. In general, this will be accomplished by collecting data from piezometers and boreholes, estimating the percent each dam is saturated, evaluating the stability of each dam over time, mapping gradients and evaluating high foundation pore pressures in each dam, and determining if piping is occurring in the dams.

Construction is the main effort proposed for this project and is funded by the RRGL grant. Proposed

installation of piezometers include 8 piezometers at Deadman's Basin Reservoir, 11 piezometers at Ruby Reservoir, 24 piezometers at Nilan Reservoir (east and north dams), and 10 piezometers at Cottonwood Reservoir. For most sites, two nested piezometers will be completed at different depths in each borehole. The proposed soil investigation program will include collection of 9 soil samples at Deadman's Basin Reservoir, 27 soil samples at Ruby Reservoir, 54 soil samples at Nilan Reservoir (east and north dams), and 9 soil samples at Cottonwood Reservoir. Soil testing includes grain size analysis, atterberg limits, moisture density, direct shear (3 normal stresses), and consolidated undrained triaxial (3 confining pressures) at different depths in boreholes and locations at each dam.

The proposed project will provide engineering information that will protect reservoir water resources and recreation use, and most importantly, it will protect downstream residents from a catastrophic and life-threatening event. The results will help DNRC make informed recommendations, and if necessary, repairs so that dam problems do not become an emergency. DNRC will perform all of the technical activities under this proposal, except drilling, which will be bid out to a qualified drilling firm.

Project Management

A Civil Engineer Specialist working for the DNRC Water Resources Division, will manage the project. The project manager will receive support from other DNRC Water Resource Division personnel and limited technical input from USBR. Project implementation is estimated to last approximately one year.

Financial Assessment:

Total cost of the proposed project is \$134,290. The following table breaks out the major costs of the RRGL grant.

RRGL Grant Costs

Laboratory	\$12,776
Construction/Drilling	72,476
Travel	11,350
Materials	3,398
Total Grant Costs	\$100,000

Estimated Total Project Costs \$134,290 RRGL Grant Share = 74%

Project unit costs for rock coring (\$33/ft), embankment drilling (\$13/ft), piezometer installation (\$11/ft), and laboratory analysis (\$13 to \$120 each) are in line with quotes from local contractors and laboratories. Braun Intertec of Billings developed all costs. The proposed RRGL grant costs are primarily focused on construction and laboratory costs. Travel for this project, about 9 % of the total cost, is relatively expensive. However, travel costs are adequately outlined in the proposal to show they are justified. In general, the proposed budget and justification are reasonable and well developed.

Project funding is in place with a firm commitment from DNRC for matching in-kind contributions for professional time.

Benefit Assessment:

The project will collect engineering data that are needed by the DNRC Water Resources Division to protect downstream residents from a catastrophic dam failure. A total of 2,501 residents live downstream of the four dams in this proposed project and may be at risk if this project is not funded.

In addition, protecting dam integrity ensures reservoir water storage for irrigation and recreationists. A total of 224 farmers use the four dams for growing crops on 84,265 acres, and there are 12,959 fishing recreation user days for the four reservoirs, not including those recreationist that use the rivers below the dams for fishing or other reservoir uses such as water skiing and hunting. Results of the proposed project will have local and statewide applicability for residents and recreationists, respectively.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of activities associated with the project.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, project administration and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 14

Applicant Name: Sanders County

Project Name: Floodplain Delineation of the Clark Fork River

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 6,710 Project Sponsor
 960 Planning Board
 3,000 DNRC - Water Resources Division

Estimated Total Project Cost: \$ 110,670

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

The increasing demand for waterfront property continues in Montana, and therefore floodplains are being "developed" more and more as people migrate to the rivers of the state. This poses a substantial threat to these environmentally sensitive areas and our critical land and water resources.

Sanders County is one of the fastest growing areas in the State of Montana, currently at a rate of 18.3 %. The county also has experienced extensive flooding in the past few years, which resulted in close to \$1 million of damage to publicly owned and private property. With increases in residential development along the Clark Fork River between the towns of Thompson Falls and Paradise, the issue of the current level and boundary of the 100-year flood has become very

important. The Sanders County Commissioners and county planner have recognized the need for implementing a floodplain ordinance and more detailed analyses of the 100-year flood boundaries and levels.

Presently, planning tools necessary to implement "wise" floodplain management in the county are extremely limited due to the lack of accurate hydrological data and detailed floodplain maps.

The proposed project will provide comprehensive hydrological data for 37.4 miles of the Clark Fork River floodplain to generate accurate floodplain maps. The maps will be used to implement a floodplain ordinance for the county and to make appropriate land-use management decisions for responsible growth. The purpose of this project is to maintain the integrity and natural functions of the Clark Fork's floodplain, mitigate damages, and protect Montana's water quality and wildlife habitat.

Technical Assessment:

Project Background

The project area covers 37.4 miles of the Clark Fork River between Thompson Falls and Paradise Montana. Sanders County is currently the seventh fastest growing county the state, at a rate of 18.3%. The majority of the increased development and proposed subdivisions are along the Clark Fork River between Thompson Falls and Paradise. This area has been declared an emergency flood disaster area in the last two years. The maps currently used for the area are from 1977 and indicate only an approximate outline of the 100-year floodplain. The project area cannot be adequately regulated with the lack of base flood elevations and designation of a floodway.

Technical Approach:

The goal of the Clark Fork Floodplain Delineation is to identify and preserve the natural resources and functions of the floodplains and to prevent groundwater and surface water pollution and aquifer overdraft. The outcome of the floodplain delineation is to assist local residents and public officials in identifying the flood hazard areas and base flood elevations. A hydrological analysis and a detailed floodplain delineation will be used to prepare flood hazard maps with flood elevations. This information will provide planners and decision makers with the kind of data they need to make informed floodplain management decisions about growth and development while protecting and preserving the natural resources of the floodplain.

The project has seven major objectives:

1. Complete an initial coordination and information search to become cognizant of the available data and identify flood problems of the study area.
2. Conduct an initial field reconnaissance to determine the extent and condition of the floodplain in the project area.
3. Identify flood prone areas to minimize risk and damages due to flooding. Complete a detailed hydrological analysis of the project area to determine the recurrence interval of flood events to the 10, 15, 50, 100, and 500-year flood discharges
4. Conduct a hydraulic analysis and obtain stream profile cross sections.
5. Compile and submit all required data to produce a flood hazard map, which will be used for floodplain management.
6. Develop and amend an appropriate floodplain ordinance for Sanders County.
7. Develop an educational and public awareness program for wise floodplain management and

BMPs for the county.

The selected approach best addresses the objective of regulating development in the floodplain. Alternatives to the project include: do nothing; complete only the 100-year stream flow hydrology for the entire county and do not obtain base flood elevation data; or complete an approximate floodplain restudy for the same reach of the Clark Fork River. The applicant has provided sufficient documentation for evaluation. The project is scheduled to take place within a year. This time frame appears reasonable.

Project Management:

Sanders County will hire a contractor (a professional hydrological engineer) using State of Montana engineering procurement procedures to oversee and implement the entire project. The contractor will follow FEMA guidelines and specifications, and will contact all local state and federal officials necessary to collect relevant information. A monthly progress report will be submitted to the Sanders County planner and disaster and emergency services officer. Quarterly public meetings will be held to involve the public.

Financial Assessment:

RRGL Grant Costs

Professional Services	\$ 30,000
Surveying and Mapping	65,000
Aerial photography	5,000
Total Grant Costs	\$100,000

Estimated Total Project Costs \$110,670 RRGL Grant Share = 90%

An estimate of the costs to do the mapping was obtained from a private hydrology and engineering firm. It was estimated that the necessary fieldwork, water surface profile analysis, and reports would require \$30,000 for 200 cross-sections at \$150 each. Surveying costs were estimated to be 200 cross-sections at \$325 each, for a total of \$65,000.

In-kind match will be \$3,120 for the project manager's services, \$1,664 for administrative support, \$526 for benefits, and \$1,400 for communication.

The funding structure for the projects is in place. All costs appear to be included and the amounts are reasonable. No spending has occurred yet.

Benefit Assessment:

Providing detailed floodplain information will allow the county to restrict building, additions, or placing of fill in high flood hazard areas. It will also allow the county to require the elevation of new structures in the 100-year floodplain. It is important information in the placement of septic systems. This study will conserve resources by reducing the amount of flood damage to the river channel and floodplain area. Proper floodplain management will eliminate building of structures in the high flood hazard area and eliminate or reduce the amount of damage to new structures in the 100-year floodplain. This provides benefits to citizens and taxpayers.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of activities associated with this project.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, project administration and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 15

Applicant Name:

City of Missoula

Project Name:

Sewer System - East Reserve Street Phases II & III

Amount Requested:

\$ 100,000 Grant

Other Funding Sources:

\$ 500,000 TSEP

1,770,257 City Revenue Bond

2,474,500 SID

220,350 SID

150,000 W/Q district - City/County funds

Estimated Total Project Cost: \$ 5,215,107

Recommended Amount:

\$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - The Missoula Valley aquifer has been designated the only sole-source aquifer in Housing Urban Development's Region VIII. The Missoula aquifer is the community's only source of drinking water and, according to current research, it is extremely vulnerable to contamination.

Problem - In January 1996, the Missoula Valley Water Quality District completed a study of eight high-density, unsewered areas to evaluate the need for connection of homes and businesses in the areas to sewage treatment facilities. The study prioritized the area for connection based on the degree of water quality degradation and potential health risks in each area.

Based on all of the factors considered, this study concluded that the East Reserve Street area represents the most significant threat to water quality and public health. With 26 % of all unsewered units in this one area, the total loading to groundwater is higher than any other area. Groundwater quality is adversely affected by the use of septic systems in highly developed areas of East Reserve Street.

Proposed Solution - Missoula is currently moving forward with installing a gravity sewer system in the East Reserve Street South area (Phase I) with construction anticipated early this summer. This project, Phases II and III, will complete the sewerage of the East Reserve Street area. The city

will install a gravity sewer system, including gravity mains and service connections where appropriate, in the Phases II and III East Reserve Street project area. This densely populated, primarily low-income area currently has no available sewer service. The proposed project is also designed to safeguard the fragile aquifer by sewerizing a densely populated area of the city. It is vital that we continue our commitment to protect the Missoula Valley water resources by making sewer service available and connection a priority in the highly developed areas of Missoula. The proposed project is an important component in the process of protecting Missoula's sole-source aquifer and the quality of the Clark Fork and Bitterroot rivers.

Technical Assessment:

Project Background:

The water supply used by the City of Missoula is known as the Missoula Valley aquifer. EPA designated this source of groundwater in 1988 as a "Sole Source Aquifer." By seeking this designation, Missoula has taken a proactive stance toward protecting the aquifer from contamination. The Missoula Valley Water Quality District (MVWQD) published a study in 1996 entitled "Evaluation of Unsewered Areas in Missoula, Montana." The purpose of the study was to provide city and county decision-makers with information regarding the need and priority for certain areas to connect to existing central sewage treatment facilities. It should be noted that this is but one of at least nine studies completed since 1985 that relate to effects of onsite wastewater treatment systems on groundwater quality in the Missoula Valley.

The MVWQD study identified the top three areas needing central systems as East Reserve, West Reserve, and East Missoula. East Missoula is moving forward with a project that will provide that community with its own central wastewater collection and treatment system. The City of Missoula has developed a three phased approach to a central sewer system for the East Reserve area, which is currently served by individual onsite systems. The first phase, which includes installation of new trunk sewers along Reserve, is nearing or currently under construction. The final two phases are proposed under this application and include extending laterals and interceptors into the unsewered areas to the east of Reserve Street.

Technical Approach:

The ultimate goal of the city, county, and other interested parties is to protect the area's only source of groundwater. The objective of this project is simple; replace existing onsite septic tank systems, cesspools, and seepage pits with a central collection system. The city is proposing an ordinance that would require hookup whenever property ownership changes. The city is also looking into incentives, particularly for low and moderate income families, that would encourage hooking up to the new mains.

The preliminary engineering report was concise and to the point. Five alternatives were identified, of which two were investigated in detail. A conventional gravity collection system was the preferred alternative over a septic tank effluent pump (STEP) system. The gravity collection system is the best long-term alternative for the community in terms of capital costs, individual responsibilities, and operation and maintenance.

The selected alternative appears to represent the best opportunity for the community to address the goals and objectives set forth to protect the Missoula Valley aquifer. For a central sewer collection system (gravity or STEP) to reduce contamination to the groundwater, a very large percentage of onsite systems, if not all, must be properly abandoned and users forced to connect to the new

system. The city should also take care that the problem is not simply shifted from the Reserve area to the treatment plant. In other words, the treatment plant must be prepared to accept the additional flows while still producing effluent that is within the city's discharge permit limits.

The proposed project schedule is quite optimistic but probably achievable. The mere size of the project scope, including physical area, easement acquisitions, coordination with public and private entities, and design logistics, lead the reviewer to believe that a six-month design window is very tight. The applicant should be prepared for the project schedule to possibly extend into 2001. It is doubtful that delays in funding from DNRC or other programs would significantly delay the project. If such delays occur, a 5% contingency has been built in for construction during 2000, which should protect the city for another year.

Project Management:

The applicant has provided a thorough, well-conceived plan for managing the project and coordinating all of the funding sources. The project will include expertise from the Missoula City/County Office of Planning and Grants, the City of Missoula Public Works Division, the city attorney and the city finance director. The budget contains adequate funding to provide proper management services.

Financial Assessment:

RRGL Grant Costs

Construction	\$ 90,000
Contingency-Construction	10,000
Total Grant Costs	\$ 100,000

Estimated Total Project Costs \$ 5,215,107 RRGL Grant Share = 2%

The funding structure is in place to fully fund the project. With the exception of the RRGL and TSEP grants, project funds are committed or should be committed soon after the grants are awarded. It appears that all costs have been included in the budget and that they are reasonable. The budget includes sufficient contingencies such that any fine-tuning later should be covered.

The average monthly residential sewer rate, including debt service, operation, and maintenance, will increase from \$6.68 to \$41.34 assuming the proposed funding package is achieved. The current average water rate is \$29.44. The combined water and sewer rates with the proposed project will therefore be \$70.78. A target rate analysis was not presented in the application.

Benefit Assessment:

The project will result in multiple uses including, among other things, allowing failed onsite systems to hook onto a central system, providing a reliable source of wastewater disposal for area residents and commercial interests, and protecting the valley's only source of potable water. The project will serve an identifiable public interest that continues to receive widespread public support. The public benefits are measurable and will be ongoing as documented by the numerous Missoula Valley aquifer studies that have been conducted over the past several years.

Environmental Evaluation:

With the exception of temporary inconvenience during construction, this project does not appear to have any actual or potential long-term adverse impacts on the environment.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 16

Applicant Name: Park County

Project Name: Hydrogeological Reconnaissance of the Paradise Valley

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 15,900 Project Sponsor
100,000 USGS

Estimated Total Project Cost: \$ 215,900

Amount Recommended: \$ 95,000

Project Abstract: (Prepared and submitted by applicant.)

Rapid expansion of residential development into the Paradise Valley has recently prompted local residents to develop a land-use plan to protect and maintain the high quality of the valley's natural resources. However, current knowledge is insufficient to guide planning efforts to protect the aquifers that underlie the valley. These aquifers provide the sole source of drinking water to all valley residents and contribute flow to the nationally acclaimed Yellowstone River. Therefore, an understanding of groundwater resources was identified as an essential component of the land-use plan that requires further development. The proposed project will address this component by characterizing the groundwater system, thereby providing a sound basis for responsible land-use planning.

The goal of the proposed hydrogeological assessment is to provide unbiased scientific information regarding the basin-fill aquifers that underlie the Paradise Valley, including water quality and the availability of groundwater for future development. The project will describe the general characteristics of the basin-fill aquifers; determine the altitude of the water table and general directions of groundwater flow; identify important recharge and discharge areas; characterize groundwater quality; and design a long-term monitoring system.

A reconnaissance-level approach will be used to achieve these objectives. Existing information will be compiled from various databases and reports. Wells and springs will be inventoried throughout the study area to document and field-verify well depths, water levels, pH, specific conductance, temperature, nitrate concentrations, and well-construction data. Water levels will be measured

monthly in a representative subset of inventoried wells. Water samples will be collected and analyzed to characterize the natural chemical quality of water from each aquifer, and to identify possible areas with existing contamination. In a reconnaissance-level assessment like this, it would be possible to miss small areas of contamination or any area contaminated with a substance that we don't sample for. Generalized groundwater flow paths will be delineated, and major recharge and discharge areas will be identified.

Technical Assessment:

Project Background:

The proposed study is located in Paradise Valley. The valley is located south of Livingston and is a popular access route to Yellowstone National Park. A detailed evaluation of the groundwater resources of the Paradise Valley has not been completed. The proposed hydrogeological study encompasses the basin-fill aquifers of the Paradise Valley from Allens Spur, on the north end of the project, to Yankee Jim Campground, on the south end of the project. Information from the study will be used by the county to help manage groundwater resources and maintain a high quality and adequate supply of groundwater for residents. The need for the project is based on: 1) the need to assess groundwater quality and availability, 2) the shallow groundwater being the sole source of drinking water for valley residents, 3) increased population growth that could impact groundwater resources, and 4) the need to monitor water quality over time to detect changes in groundwater quality. Currently, about 5,000 residents live in the valley, and in the last five years 163 new septic tank permits have been issued.

Technical Approach:

Park County seeks funds to assess groundwater quality and availability, spring water quality and flows, and the overall hydrogeologic conditions of the basin-fill aquifers of Paradise Valley. The goal of the proposed assessment is to provide unbiased scientific information regarding the basin-fill aquifers that underlie the Paradise Valley. In turn, Park County can better manage and protect groundwater resources, assuming there will be future development. USGS will perform the technical activities under this proposal, which will include inventorying about 200 existing domestic wells and springs. Information collected as part of the inventory will include, for example, well construction and condition, site location for mapping purposes, lithologic information, and collection of field parameters for groundwater elevations and general water quality (i.e., pH, SC, temperature, etc.). Water quality samples will be collected and analyzed at an offsite laboratory from about 50 selected wells and springs to characterize the water chemistry and potentially identify areas of contamination.

Mapping water-level elevations, interpreting hydrographs, and analyzing aerial photographs will identify generalized regional groundwater flow paths, including recharge and discharge areas. Water quality will also be used to map groundwater flow paths. A groundwater monitoring network will be designed to identify long-term changes in water levels and water quality. The county will operate the monitoring system after the proposed project is completed. This project primarily involves establishing baseline conditions and designing a future monitoring network.

Similarly, recharge on the valley margins from bedrock should be integrated into the study design. While difficult to assess, at a minimum domestic wells completed in bedrock on the valley margins should be included in the well inventory for analysis.

For evaluation of potential elevated nitrate concentrations in groundwater, USGS should work with Park County to determine the type and scale of hydrologic and water quality information Park County needs to manage potential nitrate impacts on groundwater from septic systems. Park

County should coordinate this study with MBMG to share water quality information and other technical information. To the extent possible, the project sponsor should coordinate with the Reclamation Development Grant study of cumulative effects on the upper Yellowstone River.

Project Management

A project coordinator with the USGS will manage the project. Park County will help guide the project, ensure the data collection and reporting efforts are relevant to Park County, and administer the grant. An Earth Science Department student from MSU will assist in collection of the technical information for this project. Project implementation is scheduled over a 27-month period.

Financial Assessment:

RRGL Grant Costs

Administration	\$ 10,600
Professional	49,850
Travel	9,000
Student	900
Laboratory	13,250
Communications	7,450
Equipment/supplies	3,950
Total Grant Costs	\$ 95,000

Estimated Total Project Costs \$215,900 RRGL Grant Share = 44%

Park County is requesting funding of \$100,000. However, in the administration breakout provided by Park County, \$5,000 of the administrative budget appears as office rent (\$3,000) and utilities (\$2,000). These costs will be incurred regardless if the project is funded or not, and therefore are program costs and are not eligible for RRGL funding. The remainder of the costs outlined in the grant application is eligible for RRGL funding. The RRGL costs cover primarily professional fees and the total amount of professional fees are conservative and adequate to complete the project. Overall, the total project costs are consistent with completing similar USGS hydrogeologic studies. Project funding is in place with firm commitments from all funding sources

Benefit Assessment:

The project will collect scientific data that are needed by Park County to manage groundwater resources and evaluate groundwater quality and availability problems that are influenced by increased growth in Paradise Valley. Primarily this project will manage and protect groundwater resources. Approximately 5,000 residents live in Paradise Valley and rely on groundwater as the sole source of drinking water. Protecting groundwater resources is therefore very important to these residents and new residents that move into the valley. In addition, identifying the hydrogeologic conditions could also benefit agriculture in that additional supplies of groundwater may be identified. Scientific data will provide the information necessary to begin making serious management decisions and planning future development.

The project involves water users in Paradise Valley. Project support is documented from a broad range of entities and individuals.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of activities associated with the project.

Funding Recommendation:

DNRC recommends grant funding of \$95,000 because \$5,000 program costs were included in the grant budget. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 17

Applicant Name: Glen Lake Irrigation District
Project Name: Costich Dam Improvements Project

Amount Requested: \$ 100,000 **Grant**

Other Funding Sources: \$ 13,976 **Project Sponsor**

Estimated Total Project Cost: \$ 113,976

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

In 1910, what is now the Glen Lake Irrigation District was formed and later placed into operation in 1914. The district provides irrigation and stock watering to farmers and ranchers north and east of the town of Eureka in Lincoln County, Montana. Water for the district is stored in two reservoirs: Glen Lake and Costich Lake. Users within the system are provided water by a series of open canals and buried conduit. This grant application discusses existing deficiencies and improvement options for Costich Dam.

The dam was constructed in 1956 as a Soil Conservation Service (SCS) designed structure utilizing corrugated metal piping through the internal core of the dam. After more than 40 years of use, this conduit has exceeded its expected life. Several reports prepared by different agencies and organizations have indicated that the pipe has exceeded its anticipated use. Photographic documentation of the conduit has confirmed that significant structural damage has occurred, and it has been recommended the dam be removed from normal service.

Preliminary evaluation of the earthen embankment indicates there is soil piping, possibly penetrating the central core of the structure. A small slump exists on the downstream face of the structure, indicating that the fines have been removed from the soil matrix. Based on the unknown extent and magnitude of the soil piping, the recommended option to repair Costich Dam is to excavate the old conveyance line and replace it with conduit of adequate size and hydraulic capacity.

Should funding be unavailable, the district would be required to construct much of the improvements with borrowed funds, generating an estimated 16.2 % increase in already high user charges. It is

the district's intention to pursue \$100,000 in grant funding from the DNRC Renewable Resource program and bear the remaining costs through district funds or in-kind contributions.

Technical Assessment:

Project Background:

Costich Dam is located in Lincoln County one mile northeast of Eureka. The dam and 570 acre-foot reservoir that it impounds are owned and managed by the Glen Lake Irrigation District. The district was formed in 1910 and has been in operation since 1914.

Costich Dam is a 24-foot high earthfill dam. It was designed by SCS (now NRCS) and constructed in 1956. Over 40 years old, the dam has been identified by DNRC as a high-hazard dam and is in need of structural rehabilitation. The existing corrugated steel outlet conduit has deteriorated to the point that it leaks, thus threatening the structural integrity of the dam due to piping. The outlet has separated 6 inches at one point, possibly due to poor initial construction.

In 1995, DNRC issued an operations permit to the district contingent on replacement of the corrugated metal outlet pipe by May 1998. A 1998 inspection has determined that the outlet works are badly deteriorated and must be slip lined or replaced if the dam is to remain in operation.

Technical Approach:

The goal of this project is to make Costich Dam operationally safe. This is necessary if the operation permit is to be renewed. Four alternatives are addressed in the application. The third and fourth alternatives are similar in scope and purpose. The construction methods differ, but both would result in a safe and operational dam. Alternative three would be to slip line and grout the existing outlet and install a new bypass conduit around the dam. The preferred alternative is to excavate and remove the existing pipe and replace it with a larger polyethylene pipe. This alternative is about \$3,000 more expensive than the third alternative, but would allow for inspection and reconstruction of a portion of the dam's core and the installation of a 36-inch diameter versus a 24-inch diameter outlet, thus providing a higher safety factor should emergency drainage of the reservoir be necessary.

Project Management:

The management structure for the district consists of a three-member board of commissioners and a district secretary. The board would manage this project. The board would execute grant and construction contracts, and all expenditures would require board approval.

The board proposes to retain an engineer for the design, technical oversight, and construction management of the project. The project would be advertised and bid in accordance with statutory requirements. Bookkeeping and records management would be the responsibility of the district secretary.

Financial Assessment:

RRGL Grant Costs

Administration	\$ 3,520
Design and Inspection	19,039

Construction	70,401
Construction Contingency	7,040
Total Grant Costs	\$ 100,000

Estimated Total Project Costs \$ 113,976 RRGL Grant Share = 88%

Projected costs for this project look reasonable. The budget includes a 10% construction contingency to be funded with Renewable Resource Grant funds. \$9,839 is to be provided by the applicant for construction. It is recommended that all Renewable Resource Grant funding be applied toward engineering and construction costs, and that the contingency be funded by the applicant.

Funding for this project includes the Renewable Resource Grant being applied for; the balance of the funding package will be provided from district reserves.

The Glen Lake Irrigation District supplies irrigation water to 144 operators on 3,221 acres. District members are currently assessed \$20.00 per acre. That assessment will not increase as the result of this project.

Benefit Assessment:

As a water development and storage project, this project provides clear renewable resource and public benefits. The project is necessary if Costich Dam is to remain in operation. The purpose of Costich Dam is to provide water storage for late season irrigation. Without the benefits provided by this additional storage, the district will be unprotected from drought, fire, and potential crop failures during most years. The area relies upon irrigation to support the cattle business and local economy. Adequate irrigation will generally promote a healthy agricultural climate.

The project area also relies on water for fire suppression, tourism and recreation, maintenance of groundwater aquifers, and a multitude of other benefits directly derived from the proper management of water resources including storage. The endangerment of life and property would result if Costich Dam, a high-hazard dam as classified by DNRC, were to continue water storage operations in its present state of disrepair.

Environmental Evaluation:

Because of its location outside of the community proper, this project would have few, if any, temporary adverse environmental impacts during construction. It is possible that a Stormwater Discharge Permit would be required, depending upon the area of surface disturbance. The construction area should be off limits to unauthorized trespassers during construction to avoid liability for the contractor and the district.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 18

Applicant Name: Town of Denton
Project Name: Wastewater Treatment Project

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 500,000 TSEP
343,400 SRF

Estimated Total Project Cost: \$ 943,400

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - The town's wastewater collection and treatment system was built in 1954. The system has had no significant upgrades and has received only a few additional connections. In February of 1997, DEQ issued a letter directing the community to prepare a report outlining the procedure by which the sewage treatment system would be brought into compliance.

Problem - The treatment system, which is 43 years old, has a decade-long history of discharge violations. The system has been identified by the DEQ Permits and Compliance Division as a persistent and chronic violator. The wastewater treatment and disposal systems are in poor condition, and without improvements the possibility of continued violations is likely.

Proposed Solution - The alternative involved is construction of a three-cell facultative lagoon on property adjacent to the existing treatment site. The system would continue to discharge directly into nearby Wolf Creek.

Technical Assessment:

Project Background:

Denton's existing wastewater treatment system is a 4.5-acre, single-cell lagoon, which has a permitted direct discharge to nearby Wolf Creek. Discharge violations have occurred over the past ten years or so, resulting in classification of the treatment system as a persistent and chronic violator by DEQ. The recent wastewater facility plan for Denton concluded that the wastewater treatment system is in poor condition and that without improvements the possibility of continued violations is likely.

Technical Approach:

The goal of this project is provide Denton with a wastewater treatment system that meets DEQ requirements. Denton's wastewater facility plan (which was completed in March 1998) considered five different treatment system alternatives in adequate detail: (1) construction of a new three-cell facultative lagoon on adjacent property with a direct discharge to Wolf Creek, (2) construction of a new three-cell facultative lagoon at the same location with a direct discharge to Wolf Creek, (3) construction of a new three-cell aerated lagoon on adjacent property with a direct discharge to Wolf

Creek, (4) construction of a new two-cell facultative lagoon with total retention on adjacent property, and (5) construction of a new two-cell facultative lagoon with spray irrigation of the effluent. Long-term operation and maintenance costs were considered. The first alternative was selected by the Town of Denton as the most cost-effective and environmentally sound solution.

Although there is some uncertainty about the actual depth to groundwater at the new lagoon site, both the project engineer and DEQ feel that this will not hinder project construction or implementation. The State of Montana's non-degradation requirements will be met by the proposed lagoon since the design population for the new facility is less than Denton's population in 1993 (which is used as the base date when determining whether new degradation of state waters will occur). The town has had some discussion with landowners adjacent to the existing lagoon site about the purchase of the 15 acres of land required for the new facultative lagoon and does not foresee any problems with land acquisition.

Project Management:

The Town of Denton adequately addresses the management of the project in its application. The project manager and the project engineer have already been appointed. Duties of the project manager include maintaining project files, reviewing project expenditures, and assuring compliance with all contract requirements. The project engineer will provide plans and specifications for the proposed project, supervise construction, and review contractor payment requests. The mayor will have ultimate responsibility for contract requirements and the town attorney will perform all required legal services. The town clerk will manage all accounting and record keeping for the project.

Financial Assessment:

RRGL Grant Costs

Construction	\$100,000
Total Grant Costs	\$100,000
Estimated Total Project Costs	\$943,400 RRGL Grant Share = 11%

All anticipated project costs appear to be included in the budget and seem reasonable. The construction costs were taken from the wastewater facility plan that was recently reviewed by DEQ, and a 10% contingency was added to these costs. The Town of Denton does not propose to commit any of its own funds to this project and the project budget includes only those costs for the Town of Denton's personnel services, office costs, and legal costs (for the town's attorney) that are directly related to the project.

The 167 households in Denton currently pay \$15.00 per month for sewer service. If the Town of Denton receives its desired funding, the projected monthly user fee will be \$24.99. The combined water and sewer user rate will then be \$46.99, which is \$13.00 more per month than the town's target rate.

The Town of Denton has already submitted its TSEP application for a \$500,000 grant and its Montana State Revolving Fund (SRF) application for a loan in the amount of \$343,400. Because of DEQ's enforcement action, the town is anxious to begin the project in the fall of 1999.

Benefit Assessment:

The direct benefactors of the proposed new Denton wastewater treatment facility are the 375 citizens of the town itself. The proposed new lagoon system should discharge an effluent meeting permit standards for biological oxygen demand (BOD), fecal coliform, and total dissolved solids (TSS). The proposed new wastewater treatment system has tremendous public support. In support of resource conservation and protection, the project will result in the elimination of excessive water loss from the existing lagoon and the improvement of the effluent quality discharged to Wolf Creek.

Environmental Evaluation:

DEQ completed a Finding of No Significant Impact (FONSI) and environmental assessment for the proposed Denton wastewater project. Minor short-term environmental impacts such as dust and noise associated with the construction activities will occur. However, no significant long-term environmental impacts were identified.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project. The project shall be designed and constructed in accordance with EPA and DEQ requirements.

Project No. 19

Applicant Name: Bitterroot Irrigation District
Project Name: Water Conservation and Improvement

Amount Requested: \$ 99,650 Grant

Other Funding Sources: \$ 113,100 Project Sponsor
 110,000 USBR

Estimated Total Project Cost: \$ 322,750

Amount Recommended: \$ 99,650

Project Abstract: (Prepared and submitted by applicant.)

The Bitterroot Irrigation District has begun a comprehensive review of its current and future needs in order to develop a strategy for water conservation and water quality improvements. In cooperation with USBR, the district is completing a water conservation plan. The goals of this plan are to:

- Improve water management throughout the irrigation system;
- Conserve water through better management and improved infrastructure;
- Preserve or improve both surface and groundwater water quality;
- Preserve water rights; and

- Ensure the continued beneficial use of the district's water for irrigation.

This plan will provide specific details for the tasks necessary to implement the district's future water conservation goals. Although the plan is not yet complete, a number of high priority tasks have already been identified and are the focus of this grant application:

1. Complete a water conservation plan for the district.
2. Install and calibrate water measurement devices throughout the system.
3. Reconstruct the Lost Horse Diversion Dam with a rock V-weir.
4. Install a remote emergency control system at the Lost Horse Diversion.
5. Replace check boards with an overshot gate and remote emergency control system at the Rock Creek Diversion site.
6. Install other Rock Creek Diversion improvements including a weir hinge system and riprap.
7. Line 1,000 feet of canal with a PVC or similar liner and measure the results.
8. Replace a 3-mile section of canal with a siphon over Dry Gulch.
9. Conduct a water user and general public education effort on improving water use and living around irrigation systems.

USBR has offered a \$100,000 grant to match with funds from other sources such as the Montana Renewable Resources Grant Program and in-kind services from the district.

Technical Assessment:

Project Background:

The Bitterroot Irrigation District began as a private company called the Bitterroot Valley Irrigation Company in 1905. The main infrastructure was originally built between 1906 and 1910. Water is diverted into the 72-mile long canal from two sources. The larger source is Rock Creek just below Como Lake, which has a storage capacity of 38,500 acre-feet. The smaller is Lost Horse Creek located in the next drainage north of Rock Creek/Como Lake. A diversion dam and 7-mile long canal bring water from Lost Horse Creek to the district canal.

Past incidents throughout the project have included canal failures caused by seepage, slumps, unusual storms, and other factors. Siphon breaks have occurred, especially during floods. Ditch leakage has been an ongoing challenge for the district throughout its history. Over the past two decades, rapid suburban growth has surrounded the district's irrigated acres. This has created new issues and challenges for district members and administrators. The project now serves 16,665 acres and 1,000 individual accounts.

Technical Approach:

The goal of this project is to improve water management, water conservation and water quality in the Bitterroot Irrigation District of western Montana. It will be carried out in conjunction with the USBR Water Conservation Field Services Program. With the assistance of USBR, the district will complete a comprehensive water conservation plan for the district. This task will identify areas for improving water conservation in addition to the activities proposed in this application.

Water measurement devices will be installed throughout the system to measure conveyance efficiencies. A total of 13 sites have been identified. District personnel will install flumes using district machinery. Staff gages will be installed and calibrated at 17 sites throughout the district. These tasks will be completed prior to the ditch lining. The information obtained through water

measurement activities will provide important information about water use within the district. This component of the project is essential to the general public education effort on improving water use and living around irrigation systems.

The Lost Horse diversion dam will be reconstructed with a rock weir and a remote emergency control system. The Rock Creek diversion site will be improved with the installation of new check boards, an overshot gate, and a remote emergency control system. Additional improvements at this site include the installation of a hinged weir system and bank stabilization. One thousand feet of canal lining will be installed in the areas with the worst documented seepage loss. Finally, a siphon over dry gulch will replace two miles of existing canal.

Project Management:

The Bitterroot Irrigation District manager will provide project management under direction from the district board. The manager is supported by a staff that includes two full time office workers, a foreman, and three ditch riders. The district also employs two seasonal employees and a local attorney.

The office staff will provide administrative support, bookkeeping, and accounting for this project. Project management should not be a difficult task since most of the large expenditures are for materials and contracted services. Consultants will be hired for this project that have a long history of similar projects and successful project management. They will provide project management assistance as part of their work on the water conservation plan. They will be available to the district to answer questions and help facilitate all tasks identified in this grant proposal. Consultants will be required to submit monthly written status reports, which can be used to compile reports to DNRC.

Financial Assessment:

RRGL Grant Costs

Professional (consultants)	\$ 15,500
Construction Materials	23,500
Construction Contract	53,000
Contingency	7,650
Total Grant Costs	\$ 99,650

Estimated Total Project Costs \$ 328,650 RRGL Grant Share = 30%

The scope and budget for this project were developed based on the financial capabilities of the irrigation district. The proposed funding sources include dollars and in-kind services provided by the Bitterroot Irrigation District, dollars and in-kind technical supported offered by USBR, and DNRC grant dollars requested in this application. These funding sources are discussed below. The district has a special need for these funds since the 1997 canal blowout cost a half million dollars thus far and has exhausted the reserve fund despite a special rate increase.

The Bitterroot Irrigation District is committed to spending up to \$113,100 for this project, mainly as cash for labor and equipment. Most of the district's current budget of \$408,300 per year is used for system operation and maintenance. This revenue is raised by an annual assessment of \$20/acre on 16,665 acres plus \$75 for each of 1,000 accounts.

USBR has offered to match district and DNRC funds for the proposed project through its Water Conservation Field Service Program for the Upper Columbia area. Specifically, USBR has offered to provide up to \$20,000 per year for the next five years to cost-share activities that are identified in the district's water conservation plan for a total of \$100,000. USBR has already contributed \$10,000 to initiate the water conservation planning process.

Benefit Assessment:

The proposed project would provide conservation and management of water resources on the Bitterroot River. Preservation and/or rehabilitation of water quality and soil resources should occur through water measurement, better control of water diverted at the headgates, and canal lining by reducing return flows and seepage. The assessment information could provide continued benefits in the basin if applied properly. This project will provide improved delivery of water to the project and address water management and irrigation efficiency throughout the all of the Bitterroot Irrigation District.

The potential water savings achieved through the project will enhance fish and wildlife values in the drainage, which provides habitat for bulltrout and westslope cutthroat, two species currently listed under the Endangered Species Act.

Environmental Evaluation:

The main purposes of the proposed project are to promote water conservation and efficient irrigation. In general, these goals will allow more water to be available for instream uses and other downstream water users. At other irrigation projects where these goals have been pursued, some impacts to wetlands have been noted due to the changes in water supply. The project sponsor should further evaluate this potential during the environmental evaluation. The improvements to Lost Horse Dam will require a 404 permit from the U.S. Army Corps of Engineers and a 124 permit from DFWP.

This project will produce some short-term adverse environmental impacts that are part of normal construction activities, such as dust from trucks hauling materials, water quality impacts resulting from in-stream work, noise, loss of vegetation, encroachment of noxious weeds, etc. Most of these short-term adverse impacts can be minimized using commonly used mitigation measures.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$99,650. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

The applicant shall evaluate impacts to wetland resources resulting from the project prior to project implementation. A plan that identifies measures to lessen impacts to wetland resources shall be submitted to DNRC prior to entering into a grant agreement to receive project funding.

Project No. 20

Applicant Name: Frenchtown Irrigation District
Project Name: Irrigation System Water Use and Water Quality Improvements

Amount Requested: \$ 32,900 Grant

Other Funding Sources: \$ 23,890 Project Sponsor
 49,300 USBR

Estimated Total Project Cost: \$ 106,090

Amount Recommended: \$ 32,900

Project Abstract: (Prepared and submitted by applicant.)

The Frenchtown Irrigation District has begun a comprehensive review of its current and future needs in order to develop a strategy for water conservation and water quality improvements. In cooperation with USBR, the district is completing a water conservation plan. The goals of this plan are to:

- Improve water management throughout the irrigation system;
- Conserve water through better management and improved infrastructure;
- Preserve or improve both surface and groundwater water quality;
- Preserve water rights; and
- Ensure the continued beneficial use of the district's water for irrigation.

This plan will provide specific details for the tasks necessary to implement the district's future water conservation goals. Although the plan is not yet complete, a number of high priority tasks have already been identified and are the focus of this grant application:

1. Complete a **water conservation plan** for the district.
2. Install **water measurement devices** throughout the system.
3. Replace two **radial gates** to improve water regulation and reduce leakage at two stream crossings.
4. Rehabilitate a **flume** over Mill Creek to reduce leaks and water quality concerns.
5. Rehabilitate three **headgates**.
6. Sponsor a water user and general public **education program**.

USBR has offered a \$100,000 grant to match with funds from other sources such as the Montana Renewable Resources grant program. USBR also has offered technical assistance to evaluate options, design improvements, oversee construction, and evaluate results.

The Frenchtown Irrigation District is small and hopes to preserve irrigated agriculture as a part of the local community. Aging infrastructure, low profits, environmental concerns, rapid suburbanization, and other factors are becoming even greater challenges for small districts. The district is committed to funding these improvements by raising the per-acre assessment fee and by providing equipment and labor for construction.

Technical Assessment:

Project Background:

The Frenchtown Irrigation District was established in 1934 and serves 371 users on approximately 5,000 acres. Water is diverted from the Clark Fork River west of Missoula into a 16-mile long canal. Canal flows can be diverted back to the river through several laterals and at two stream crossings. Tailwater from the entire system returns to the river near Huson. Over the past two decades, rapid suburban growth has surrounded the district's irrigated acres. This has created new issues and challenges for district members and administrators.

The district has an ongoing program of water management improvements aided by a variety of state and federal agencies. Water management improvements have also been common on individual farms.

Technical Approach:

The goal of this project is to improve water management, water conservation and water quality in the Frenchtown Irrigation District of western Montana. It will be carried out in conjunction with the USBR Water Conservation Field Services Program. With the assistance of USBR, the district will complete a comprehensive water conservation plan for the district. This task will identify additional areas for improving water conservation in addition to the activities identified in this application.

Water measurement devices will be installed throughout the system to measure conveyance efficiencies. A total of seven sites have been identified. In addition, staff gages will be installed and calibrated at six locations throughout the district. The information obtained through water measurement activities will provide important information about water use within the district. This component of the project is essential to the general public education effort on water conservation and living around irrigation systems.

Infrastructure improvements include the rehabilitation of the Mill Creek flume and replacement of five control structures throughout the system. The Mill Creek Flume is a 350-foot wooden structure that carries water from the Frenchtown canal over Mill Creek. The flume would be sealed using a commercial sealant. Approximately 25 % of the flume has already been sealed as a trial to confirm the feasibility of this approach.

The replacement of control structures throughout the system is necessary due to the effects of age and weather. The leaky and in some cases failing structures contribute to overall system inefficiencies.

With the aid of USBR, the district will implement a water user education program that consists of an irrigation guide, specific to the district, that includes average crop moisture use; critical moisture periods; drought strategies; and other information on irrigation practices. Finally, the district will hold a field tour of district infrastructure with discussions of system function, water use, district goals and future improvements

Project Management:

The Frenchtown Irrigation District manager will provide project management under direction of the district board. The district secretary will provide administrative support, bookkeeping, and accounting for this project. Project management should not be a difficult task since most of the large expenditures are for materials and contracted services. Consultant(s) will provide project management assistance as part of the work on the water conservation plan. Consultants will be required to submit monthly written status reports, which can be used to compile reports to DNRC.

Financial Assessment:

RRGL Grant Costs

Professional (consultants)	\$ 12,000
Construction Materials	19,000
Contingency	1,900
Total Grant Costs	\$ 32,900

Estimated Total Project Costs \$106,090 RRGL Grant Share = 31%

The Frenchtown Irrigation District has committed to spending \$18,190 in cash and \$5,700 in in-kind services (unpaid labor) for a total contribution of \$23,890 for the proposed project. The district's current budget of \$35,000 per year is used for system operation and maintenance. This revenue is raised by an annual assessment of \$7/acre on 5,000 acres. In addition to the revenue, the district currently has a cash reserve of \$28,000. The total cash contribution of \$21,850 for this project will come from an increase in the per-acre assessment. The district board has agreed to increase the annual assessment by \$2/acre (to \$9/acre) for a period of three years to raise a total of \$30,000 for this project.

USBR has offered to match district and DNRC funds for the proposed project through its Water Conservation Field Service Program for the Upper Columbia Area. Specifically, USBR has offered to provide up to \$15,000 per year for the next five years to cost-share activities that are identified in the district's water conservation plan. USBR has also offered to provide a variety of technical assistance to support the district's water conservation planning activities including site evaluation, design, cost estimation, and alternatives evaluation.

Benefit Assessment:

The proposed project would provide conservation and management of water resources in the Clark Fork River Basin. Preservation and/or rehabilitation of water quality and soil resources should occur through water measurement, better control of water diverted at control structures, and canal lining by reducing return flows and seepage. The assessment information could provide continued benefits in the basin if applied properly. This project will address water management and irrigation efficiency throughout all of the Frenchtown Irrigation District.

This project will greatly enhance the beneficial use of water throughout the 5,000-acre district. The compilation of a water conservation plan, water measurement program, and improvement in overall system infrastructure will improve water management in the district with ensuing resource benefits to the larger Clark Fork River Basin.

Environmental Evaluation:

At other irrigation projects where these goals have been pursued, some impacts to wetlands have been noted due to the changes in water supply. The project sponsor should further evaluate this potential during the environmental evaluation. Otherwise, this project will produce some short-term adverse environmental impacts that are part of normal construction activities, such as dust from trucks hauling materials and the operation of construction equipment, water quality impacts from work within the stream, noise, loss of vegetation, encroachment of noxious weeds, etc. Most of

these short-term adverse impacts can be minimized using commonly used mitigation measures.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$32,900. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

The applicant shall evaluate impacts to wetland resources resulting from the project prior to project implementation. A plan that identifies measures to lessen impacts to wetland resources shall be submitted to DNRC prior to entering into a grant agreement to receive project funding.

Project No. 21

Applicant Name: Town of Boulder

Project Name: Water Systems Improvement

Amount Requested: \$ 100,000 Grant
 927,000 Loan

Other Funding Sources: \$ 10,000 Project Sponsor
 500,000 TSEP
 400,000 CDBG

Estimated Total Project Cost: \$1,927,000

Amount Recommended: \$ 100,000 Grant
 \$ 907,000 Loan

Project Abstract: (Prepared and submitted by applicant.)

The Town of Boulder's original water system was constructed in 1953. Several facilities have been added to the system since then including: new wells, water main extensions, and a new water tank. The steel piping, which makes up over 80 % of the distribution system is past its useful life. Currently 40 % of the water pumped by the town is lost to leakage out of the distribution system. During summer months, the town sometimes experiences water shortages. In addition, the existing piping is not adequate to deliver required fire flows for the community. Also, the system is out of compliance with the EPA lead and copper rule. Corrosion within the system results in exceedances of the copper levels set by EPA. The lead and copper rule is an EPA mandate, which requires action by January 1999. DEQ notified the town of its exceedance and the next course of action in a letter dated June 20, 1995.

Problem - The town's water system has the following deficiencies:

1. Does not meet water quality standards of EPA lead and copper rule.
2. Severe leakage from distribution mains.
3. Undersized distribution mains, resulting in inadequate fire flows.

4. No accurate way of measuring total water usage.
5. Dead-end distribution mains.

Proposed Solution - The proposed project involves installation of corrosion control treatment equipment at each well to allow the system to come into compliance with the lead and copper rule, which is an EPA mandate. The project also involves replacement of approximately 30,000 feet of distribution main and appurtenances such as gate valves, hydrants, fittings, and service lines. Reduction in leakage will allow the town to grow without exceeding the capacity of the water system. Also, new mains will allow the town to meet fire flow requirements for insurance specifications. Finally, the project will also include installation of water meters at each well, so the town can accurately measure the system's total usage.

Technical Assessment:

Project Background:

The proposed project consists of improvements to the public water system for the town of Boulder. These improvements will address specific deficiencies in the system that impact water and energy conservation, public health, and public safety.

The system is currently in non-compliance with the EPA lead and copper rule. Recent sampling of tap water within the community indicates excessive lead and copper concentrations. Caused by corrosivity of the water that is being pumped from wells, excessive amounts of lead and copper are being introduced to the water supply through the corrosion of lead and copper based plumbing systems.

The current distribution lines, installed initially in 1953, are badly deteriorated. It is estimated that 40% of the water consumption for the system is due to leakage losses. Due to inadequate sizing and tuberculation inside the lines, adequate fire flows and pressures are impossible to achieve. A fire during periods of peak demand would result in negative system pressures, a serious public health threat.

Finally, the proposed project will include the installation of water meters at each of the system's four wells. This will allow the community to better assess its water usage and losses and to better manage its system.

Technical Approach:

The goals of this project are to conserve water and energy by eliminating water losses due to leakage; bring the system into compliance with the EPA lead and copper rule; bring the system's fire flow capabilities up to acceptable standards; and provide a method to accurately monitor overall system consumption.

These goals will be achieved by the proposed project. The project will replace 30,000 lineal feet of antiquated distribution lines thereby eliminating system losses due to leakage. This will also provide the quantities and pressures needed to meet fire flow requirements. The installation of wellhead treatment equipment at each of the community's four wells will reduce the corrosivity of the water and bring the system into compliance with the lead and copper rule. The installation of wellhead meters will allow the community to accurately monitor its water consumption. The community will be able to identify excessive demands, and to promote conservation measures (including the future installation of individual meters) that will reduce water and energy consumption.

A water system analysis has been conducted for the community. That report identifies existing deficiencies in the system and investigates methods to correct them. The analysis includes engineering documentation to support its findings, and includes an assessment of funding alternatives to finance the improvements.

The proposed project will be completed in the year 2000. Construction is scheduled to take place during and between the months of April and September. The project has been phased, based on priorities determined by the community, to allow for funding availability for the CDBG, TSEP, and Renewable Resource programs.

Project Management:

The project management team proposed for this project consists of the mayor and town council, an administrative consultant responsible for grant administration, and the town clerk, who will be the fiscal contact for the project. The engineer will be responsible for field inspection, submittal and change order review and approval, progress certification, and general technical oversight.

The Town of Boulder is familiar with public bidding and procurement statute, and will advertise and bid this project accordingly. Wage and labor standards for the project will be strictly enforced.

Financial Assessment:

RRGL Grant Costs

Design/Inspection	\$ 15,000
Construction	75,000
Contingency	10,000
Total Grant Costs	\$100,000

RRGL Loan Costs

Administration	\$ 2,000
Loan Fees and Bond Counsel	125,000
Design/Inspection	125,000
Construction	615,000
Contingency	60,000
Total Loan Costs	\$ 927,000

Estimated Total Project Costs \$1,927,000 RRGL Grant Share = 5% RRGL Loan Share = 48%

Proposed funding for this project include a CDBG grant in the amount of \$400,000 and a TSEP grant in the amount of \$500,000. These are current (1998) applications and have not been awarded as of the date of this application and review. The budget for this project is based upon a reasonable estimate of the total cost for the project. Because the community's combined water and wastewater user charges are projected to be less than established "target" rates, it is probable that loan funding will be higher than presented in the budget, and that grant funding will be less than requested through the Treasure State Endowment Program. The Renewable Resource Loan request should be increased \$20,000 to allow for budget deficiencies pertaining to bond costs that

were underestimated in the application budget.

The Town of Boulder's municipal water system provides service to 470 residential and 55 commercial users. The average residential rate will increase from \$12.50 to \$24.00 per month as the result of this project.

Benefit Assessment:

This project will eliminate an estimated 40% water loss (100 million gallons per year) due to leakage in the deteriorated distribution system currently in use. In addition to water conservation, the project will also significantly reduce pumping costs and energy consumption. The addition of wellhead meters to measure actual water consumption (for the entire system) will enable the community to more accurately monitor its consumption and identify new water conservation measures.

The installation of a new distribution system will provide the water pressures and quantities required to meet recommended fire flows for the community. This will benefit public safety and will promote development within the community.

The wellhead treatment of the water supply to reduce corrosivity and bring the system into compliance with the EPA lead and copper rule will prolong the life of the system and will provide measurable benefits to public health within the community.

Environmental Evaluation:

This project will produce the typical short-term adverse environmental impacts that normally are encountered during utility construction. Dust abatement procedures, traffic control procedures, dewatering system discharge plans, load restrictions on public roads and streets, and other construction requirements must be identified and enforced.

All construction will take place in established corridors, and there should be no impacts to features of historical or archaeological significance.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 22

Applicant Name:	Daly Ditches Irrigation District		
Project Name:	Republican Canal Diversion Dam Replacement		
Amount Requested:	\$ 100,000	Grant	
	730,691	Loan	
Other Funding Sources:	\$ 10,465	Project Sponsor (Cash)	
	37,630	Project Sponsor (In-Kind)	
Estimated Total Project Cost:	\$ 878,786		
Amount Recommended:	\$ 100,000	Grant	
	\$ 730,691	Loan	

Project Abstract: (Prepared and submitted by applicant.)

The Daly Ditches Irrigation District proposes to replace the Republican Diversion Dam located in the Bitterroot River five miles south of Hamilton and originally built in 1890 of untreated timbers. The dam currently provides water to 2,977 acres, serving approximately 665 households.

The 1988 watershed investigation report conducted by the SCS (now NRCS), USFS, and DNRC concluded that failure of the structure was imminent and "could spell environmental and economic disaster for the system." The report concluded that replacement of the structure was urgently needed.

The district is seeking a combination of grant and loan funds from the Montana Renewable Resource Grant and Loan Program to be used in conjunction with district cash reserves and in-kind contributions to replace the diversion dam. The proposed replacement project will ensure the continued availability of water to irrigators, prevent potential property loss and significant environmental damage, enhance fish and wildlife habitat, and provide for enhanced recreational opportunities. When funding has been secured, the project will proceed in two phases.

The Design/Permitting Phase:

During this phase appropriate alternative designs for the replacement of the diversion dam will be developed. Fish passage will be a key element of the project design. DFWP concludes that fish passage is critical in providing access to spawning areas for native Montana trout such as bulltrout and cutthroat trout. Bulltrout are proposed to be listed as a threatened species under the Endangered Species Act on June 13, 1998. There is no fish passage upstream of the present structure.

The Construction Phase:

Once a preferred alternative has been selected, construction documents and specifications will be developed and bids solicited for construction. The construction schedule for completion will depend upon the preferred alternative that has been selected. It is anticipated that the replacement structure(s) would be in place by the summer of 2001.

Technical Assessment:

Project Background:

The Daly Ditch Irrigation District owns and operates an irrigation system located in Ravalli County, east of the town of Hamilton, Montana, and east of the Bitterroot River. The Republican Canal starts in the east bank of the Bitterroot River about five miles south of Hamilton. The canal flows 12.75 miles in a northerly direction. It irrigates 2,977 acres, of which 2,312 acres are in agricultural production. The total volume of water delivered by the ditch annually is 8,932 acre-feet.

The Republican Diversion Dam is a 500-foot long timber crib dam with a rock-filled apron and was originally built in 1890. The dam spans two channels in the river. The West and East channels are about 150 feet and 350 feet long, respectively.

There is an urgent and immediate need for the district to replace the existing dam before it fails. The 1989 Daly Ditches Watershed Investigation Report prepared by the SCS predicted imminent failure of the dam. The report further states that the failure of the dam would affect the stability of the Hedge Diversion Dam and lead to environmental and economic disaster for the system. The district has spent approximately \$43,000 in the last five years, and the cost of repairing the structure in the last three years has been continuously escalating.

Technical Approach:

The goal of this project is to replace the existing Republican Diversion Dam to prevent the failure of the dam and the resulting environmental and economic damage that would result in the event of dam failure. This project would maintain the current volume of irrigation water (8,932 acre-feet annually) supplied to the Republican Ditch. The installation of fish and floater passage will greatly improve recreational opportunities and enhance the fish and wildlife habitat. Dam replacement would help to preserve the river channel integrity and prevent potential property damage both upstream and downstream caused by failure of the structure.

To accomplish these goals, the district proposes to implement a three-phase approach to the project. The first phase will include the environmental scoping, preliminary alternative investigation, and public comment period. This phase will follow the requirements set forth by the National Environmental Policy Act (NEPA) and the Montana Environmental Policy Act (MEPA).

The second phase will include a review of project funding commitments and a complete site investigation and field survey. Alternatives will be developed with a preliminary design of the proposed alternatives, public comment period, and the selection of the preferred alternative. This phase will include final design, permitting, and the preparation of construction bids.

Demolition of the existing structure and construction of the new dam would be completed in Phase III.

Project Management:

The Daly Ditches Irrigation District proposes to develop a project management team consisting of district staff and board members, an interdisciplinary advisory team, and a contracted consulting engineering firm. The district president and district manager will provide project management under direction from the district board. An experienced attorney will provide bond counsel and a consulting engineering firm will be provide technical and environmental support.

The district proposes to organize an interdisciplinary team to assist with identifying and analyzing the technical alternatives for the project and to assist in selecting the preferred alternative. The team will include a representative from Ravalli County, the Bitterroot Conservation District, NRCS, U.S. Army Corps of Engineers, DFWP, and DEQ.

This interdisciplinary team will be very effective for the district, since the Bitterroot River receives a significant amount of public use and is home to environmentally sensitive species, such as the endangered bulltrout.

Financial Assessment:

RRGL Grant Cost:

Engineering & Design	\$100,000
Total Grant Costs	\$100,000

Loan Funding

Construction	\$591,350
Contingency	\$ 88,065
Inflation Factor	\$ 29,355
Loan Origination fee	\$ 21,921
Total Loan Costs	\$730,691

Estimated Total Project Costs \$878,786 RRGL Grant Share = 11%/RRGL Loan Share = 83%

The scope and budget for this project were developed based on the financial capabilities of the irrigation district. The proposed funding sources include dollars and in-kind services provided by the district and in-kind technical support offered by NRCS. Grant funds for the project will be used to complete final design and bid preparation. Loan funds will be used to complete project construction.

The Daly Ditches Irrigation District is committed to spending up to \$37,630 for this project, mainly as cash for labor and equipment. A majority of the district's current budget of \$217,970 per year is used for system operation and maintenance. This revenue is raised by an annual assessment of \$12.62/acre on 14,538 acres. If the district approves this project, the projected annual assessment will increase to \$16.78/acre.

DFWP has offered \$50,000 for a fish ladder/screen component of the project, depending of the specifics of the final design. The district is also researching other grant funds from the Future Fisheries Improvement Program of the River Restoration Act. However, grant funds would be available only after the alternative selection and design phase has been completed.

The project cost for a permanent diversion structure 500 feet long with features for boat and fish passage may be underestimated. More technical details from the applicant, such as conceptual dam sections and a site plan, would allow a better assessment of costs. With a structure this size and the possible need for an environmental impact statement, the cost of this project could go over \$1 million.

Benefit Assessment:

This project will ensure continued beneficial use of the district's water for irrigation purposes, preserve water rights, improve water management throughout the irrigation system, and conserve water through better management and improved infrastructure.

Furthermore, this project will benefit the public by enhancing recreation opportunities, including fishing and wildlife observing, and by providing floaters with a structure that allows boat/raft passage without having to portage around the structure.

The project will improve fisheries upstream by the construction of a fish ladder and headgate screens, and by preventing a potential head cut and streambank erosion.

The district received letters of support for their project from the Bitter Root RC&D, Bitterroot Conservation District, DFWP, Bitterroot Valley Chamber of Commerce, and Ravalli County.

Environmental Evaluation:

This project will produce some short-term adverse environmental impacts that are part of normal construction activities, such as dust from trucks hauling materials and the operation of construction equipment, water quality impacts from work within the stream, noise, loss of vegetation, encroachment of noxious weeds, etc. Most of these short-term adverse impacts can be minimized using commonly used mitigation measures.

Since the structure is 100 years old, there is a potential for the rehabilitation construction to affect historical resources. This project will require an appropriate level of environmental review, meeting current MEPA guidelines and potentially NEPA requirements.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 23

Applicant Name: West Crane Sprinkler Irrigation Project
Project Name: West Crane Irrigation Project

Amount Requested: \$100,000 Grant

Other Funding Sources: \$258,133 Project Sponsor
 18,624 Richland Development (In-kind)

Estimated Total Project Cost: \$376,757 (For Design Phase Only)

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

The West Crane Sprinkler Irrigation Project (WCSIP) is located in Richland County, Montana's 18th most populous county, near Sidney, Montana, the county seat and the state's 14th largest city. Twenty-four farm families invested private funds to consider the feasibility of this system designed to take advantage of existing Richland County Conservation District water rights, attractive location, climate, and topography. Existing and potential markets for a variety of crops, suitable soils, and water quality all contribute to the potential of making this system a demonstration model for future sprinkler irrigation development.

5,000 acres of dry-land farm ground is needed to support one farm family, but a single farm family can be supported by 1,000 acres of irrigated land. As a vehicle for overall economic development in the region, WCSIP has the potential of putting \$8 million dollars a year into the local economy and for creating one new on- or off-farm job for every 100 irrigated acres. According to estimates from the Montana State University-Eastern Agricultural Research Center, there are close to 500,000 acres of regional land that can be brought under sprinkler irrigation.

Completion of the engineering and design project is necessary to build a sprinkler irrigation system that provides a means of: implementing improved natural resources, land, and farm management practices to enhance the way natural resources are used and conserved; increasing farm income by developing value-added products and alternative high-value rotational crop development; keeping young farmers in Montana and on the farm; attracting food processors; and expanding an agricultural business tradition that Montanans understand. The Freedom to Farm Act of 1996 and the MDA Goals 2005 vision have stimulated farmers' interest in utilizing improved farm resource conservation practices.

Technical Assessment:

Project Background:

A group of 24 farm families in Richland County, Montana, invested private funds to consider the feasibility of creating a large irrigation district to use existing water rights reserved for the Richland County Conservation District. WCSIP retained IRZ Consulting of Hermistad, Oregon, to complete a feasibility study, which was completed in January 1998.

The feasibility study presented various options for developing an irrigation district. WCSIP elected

to pursue development of an irrigation system that will serve approximately 12,000 acres of land that is currently dry-land farmed. The total estimated capital cost to complete the project as reported in the feasibility study is \$21,525,400 (\$1,803/acre).

WCSIP, with assistance from Richland Economic Development (RED), applied for a Renewable Resource grant to assist funding design services for the sprinkler irrigation project. No financing package has been developed for construction of the project.

Technical Approach:

The goal of WCSIP is to complete engineering and design-phase services for the proposed irrigation project. Selection of an engineer is expected to occur in the summer of 1999.

Project objectives include completion of topographic and construction surveying, final plans and specifications contract documents, permitting, and scheduling. A final construction cost estimate and construction management plan will also be completed during the design phase.

Financial Assessment:

RRGL Grant Costs

Professional Services Costs \$100,000

Total Grant Costs \$100,000

Estimated Total Project Costs \$376,757 RRGL Grant Share = 26.5%

The identified costs of the project include professional services only. Specific information was not provided regarding WCSIP user rates required for operation and maintenance costs or debt retirement. The cost of completing the proposed final engineering and design amounts to \$31.40 per acre. If the balance to complete the study of \$276,757 is borrowed for 20 years, the assessment necessary to retire the debt will amount to approximately \$2.00 per acre. Feasibility study projections for the completed irrigation project are \$38/acre/year for power, \$17.50/acre/year for operation and maintenance, and \$174/acre/year for amortized capital costs.

The applicant anticipates funding the remaining portion of the design-phase budget with an anticipatory bond sale. However, it will not be possible to obtain bonding until WCSIP has been formally recognized as an irrigation district with the legal capacity to finance improvements through bonds.

The feasibility study author did not include costs for legal services associated with forming an irrigation district and preparing contracts, financial costs for borrowing money, costs of acquiring permits and easements, and legal and technical assistance costs needed to address environmental concerns. The author of the feasibility study acknowledged these costs could be either "relatively minor" or "very large." These issues are critical to the design process and associated costs should be included in the design phase of the project. It appears the submitted project budget is not adequate. The applicant indicated consultants are working to identify the extent and cost of services necessary to address these issues. An additional loan or assessment to district members will likely be required to cover the additional technical assistance costs associated with these items.

Project Management:

The combined management teams from the WCSIP and RED are directing the project. RED serves as a technical resource and facilitator, WCSIP is responsible for decisions regarding program direction and project expenditures. WCSIP has received temporary funding to hire a consultant to serve as the project coordinator. The project will be managed through the combined efforts of these groups and individuals.

The department is concerned that the project could be hindered as a result of lack of coordination between the interested parties. It should also be emphasized that this project cannot move forward prior to the formation of an irrigation district to act as a conduit for the transfer of public funds. The creation of an irrigation district as a formal public entity is typically two years.

Benefit Assessment:

Completion of the proposed design work will enable WCSIP to proceed with bidding and construction as soon as WCSIP is in legal compliance with regulating agencies and has been recognized as an irrigation district.

Completion of project plans, specifications, and contract documents will not result in any identified public benefit. However, ultimate completion and operation of the irrigation project will directly benefit 24 irrigation district members. Benefits are immediate and long term. The project is also projected to benefit Richland County by providing one new job for every 100 acres of land served by the irrigation system and by increasing the tax base through the increase in value of irrigated farm land over dry-land farm land.

Environmental Evaluation:

No long-term adverse environmental impacts will result from the proposed study. The environmental impacts associated with construction of the irrigation project are being addressed in an ongoing environmental assessment.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Funding will be provided after the West Crane Sprinkler Irrigation District is recognized as a legal public entity.

Project No. 24

Applicant Name: Hebgen Basin/West Yellowstone Refuse District
Project Name: Composting Facility for Municipal Solid Waste

Amount Requested: \$ 99,425 Grant
 2,080,000 Loan

Other Funding Sources: \$ 10,125 Project Sponsor
 35,366 Refuse District
 52,567 Interlocal
 61,000 Other Grants

Estimated Total Project Cost: \$2,338,483

Amount Recommended: \$ 99,425 Grant
 \$2,080,000 Loan

Project Abstract: (Prepared and submitted by applicant.)

This proposal requests a design/development grant in the amount of \$99,425 and a construction loan in the amount of \$2,080,000. The primary purpose of the proposed project is to construct a composting facility, which will produce compost from municipal solid waste, for the Hebgen Basin/West Yellowstone Refuse District and Yellowstone National Park. This will reduce landfill needs, greenhouse gas production, hauling costs, groundwater pollution, and tipping fees, and will provide a viable, economic product from what is now a waste product. The project includes a grant request portion and a construction loan portion for the construction of a composting facility located at the West Yellowstone, Montana, transfer station just north of the town of West Yellowstone and adjacent to Yellowstone National Park. Feasibility studies indicate that the project will provide a minimum of 20 years of service when operated and maintained properly.

Since 1995, five Southwest Montana counties, two cities, and Yellowstone National Park have cooperatively investigated the possibility of decreasing solid waste costs and wastes and reusing or recycling over half of the region's solid waste stream. A feasibility study was conducted for the purpose of ascertaining the possible benefits of such a program. The study indicates that this process will be economically viable and will provide major measurable benefits in land-use improvements and long-term solid waste cost reduction. In 1998, the entities involved entered into inter-local agreements to provide funding for implementation of the recommendations and findings of the study.

Composting of municipal solid waste is a proven but not highly used technology. It has recently been used in high-altitude, cold temperature applications with good success. The proposed facility will meet all of our local recycling goals and will effectively resolve one of the biggest challenges facing the municipal governments and other entities involved. Development of this type of facility in close proximity to Yellowstone National Park provides the opportunity for public education and promotion of the practice of composting that is unique in this country.

Technical Assessment:

Project Background:

Broadwater, Jefferson, Madison, Gallatin, Park, and Sweet Grass counties and Yellowstone National Park initiated this project in 1995. The participants in this project are taking a proactive approach to reduce the amount of municipal solid waste that is disposed in landfills located in southwest Montana.

The applicants are hoping to decrease the amount and cost of solid waste disposal in the study area through the design and construction of a municipal solid waste composting facility in West Yellowstone. Eventually, a larger facility will be constructed in northwest Gallatin County near Bozeman at the Logan landfill. This application deals with the West Yellowstone facility only. This facility will handle municipal solid waste from half of Yellowstone National Park, the City of West Yellowstone, and southern Gallatin County. The facility will process approximately 4,500 tons of municipal solid waste. It is anticipated that approximately 3,000 tons of waste will be diverted from the landfill each year.

Technical Approach:

This project consists of the design and construction of an indoor municipal solid waste composting facility at an existing transfer station site near West Yellowstone, Montana. The first step of the composting operation will consist of preprocessing the municipal solid waste to remove recyclable materials and add sewage sludge. The curing phase will follow processing and will consist of windrowing the waste. The windrows will be turned periodically to expose the waste to the air and oxygen. The introduction of air allows microorganisms to decompose the waste. The final phase consists of removing inorganic material such as glass and plastic from the waste.

The goals and objectives of the project are to reduce the amount of municipal solid waste that enters landfills and to reuse municipal solid wastes through composting and recycling. The project will also cut down on fuel costs by reducing transportation requirements. The composting of solid waste will reduce the production of methane gases and leachate. Landfill tipping fees will also be reduced. These goals are attainable and can be quantified.

The composting process will take place inside a new building so the process can be performed during winter months when processing outdoors is not possible. Equipment will be needed for turning the windrows and for processing the compost. The compost can be used for soil conditioning, reclamation projects, landscaping, etc. This project appears to be technically feasible based on the information provided by the applicant.

Permitting and compliance issues were briefly discussed in the study. Based on the information provided, there should be no major hurdles relating to compliance. The proposed facility will be located on national forest land at the existing transfer station site. The existing special use permit may have to be changed. The project schedule appears to be reasonable if funding can be obtained.

Project Management:

Gallatin County in cooperation with the solid waste district will oversee project management. A private consultant will perform the final design and technical review. Project administration and financial management has been well documented in the financial plan portion of the application.

Specific tasks and responsibilities were outlined for each member of the management team.

Financial Assessment:

RRGL Grant Costs

Contract Administration	\$ 6,575
Professional & Technical	92,850
Total Grant Costs	\$ 99,425

RRGL Loan Costs

Contract Administration	\$ 7,000
Professional & Technical	26,759
Construction Costs	2,046,241
Total Loan Costs	\$ 2,080,000

Estimated Total Project Costs \$ 2,338,483 RRGL Grant Share = 4.25% / RRGL Loan Share = 89%

The costs presented in the study are broken down into building costs and equipment costs. A detailed breakdown of project cost was not provided in the application, but the project budget appears to be adequate based on the additional information provided at the reviewer's request.

The five counties, two cities, and Yellowstone National Park have agreed to contribute 25 cents per person per year to the planning and design portion of this project, or approximately \$24,000 per year.

The analysis of long-term operation and maintenance should be evaluated further. Staffing and labor costs are addressed. However, with \$600,000 of equipment required, considerable operation and maintenance (O&M) issues exist with this facility, and a thorough discussion relating to O&M was not provided. This is an O&M intensive facility, and O&M costs can represent a significant amount of the annual cost for a project.

Benefit Assessment:

This project will significantly benefit citizens by reducing total landfill costs, conserving landfill space, and providing a beneficial reuse for a significant portion of the area's municipal solid waste. These benefits can be easily quantified by measuring the reduction of waste taken to area landfills, the reduction in landfill fees, and the reduction in landfill leachate production and the amount of compost that is produced and sold. These benefits will continue for the life of the project.

Environmental Evaluation:

The composting site must be located to avoid unacceptable impacts to the environment. Potential impacts can occur to groundwater, surface water, wildlife, and other environmentally sensitive or unique areas. DEQ's solid waste management license review will determine if the site, as designed, will result in unacceptable impacts to the environment. Since the proposed facilities are located at existing municipal solid waste facilities, the controversy that typically accompanies facility siting will be diminished. Short-term impacts associated with construction (dust, noise, equipment traffic) will

occur. These impacts can be mitigated using standard techniques.

Funding Recommendation:

DNRC recommends grant funding of \$99,425, the total amount requested, and loan of \$2,080,000. Grant and loan funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 25

Applicant Name: Teton County Conservation District
Project Name: Irrigation Methods and Pesticide Transport to Groundwater

Amount Requested: \$ 100,000 Grant

Other Funding Sources:

\$ 1,556	Project Sponsor
15,000	American Cyanamid
12,048	MDA
1,000	DEQ/EPA 319 Grant
5,000	DEQ
25,757	MBMG

Estimated Total Project Cost: \$ 160,361

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Herbicide residues have been detected at widespread locations in the Greenfields Bench aquifer and in surface water near the town of Fairfield. Available information indicates that the contamination represents non-point source pollution related to application of agricultural chemicals and intensive irrigation in an area where groundwater is vulnerable to contamination. The contaminant levels have been very low and are not considered an immediate health threat. The aquifer is considered a sole-source aquifer and is the only source of drinking water for approximately 2,000 local residents.

Because of the impacts to the Greenfields aquifer, the Montana Department of Agriculture (MDA) is developing the state's first Specific Agriculture Chemical Groundwater Management Plan (SMP). An integral part of the SMP will be developing management strategies to prevent contamination of the aquifer. Irrigation practices will be a primary consideration in plan development, yet at this time there is insufficient information available to determine what role different irrigation practices have on the amount of chemicals being transported to groundwater and surface water.

The purpose of this project will be to evaluate, under actual field conditions, how the two primary irrigation methods used on the bench (sprinkler versus flood) influence the amount of chemicals transported to groundwater. This information will be used by MDA to develop effective guidelines that will provide a basis for water-quality protection and future groundwater resource management.

Ultimately, the information will educate water users about the role irrigation practices play in transport of agricultural chemicals to surface and groundwater.

Teton County Conservation District is sponsoring the proposed project, and MBMG will be the lead technical organization.

Technical Assessment:

Project Background:

The proposed study is located about 30 miles northwest of Great Falls in central Teton County. The project consists of two study plots approximately 80 acres each within the Sun River Irrigation Project. The study plots will be used to evaluate irrigation practices and transport of pesticides, and primarily an herbicide, to groundwater. The need for this project is based on pesticides, and their degradation products, being detected in 3 public water supply wells, 1 school water supply well, and 13 private water supplies in the Greenfields Bench area. MDA began monitoring groundwater in 1984, including testing 38 of about 400 water wells in the general area. Although the concentration of pesticides detected in groundwater was relatively low, the sponsor reports there is growing public concern about the potential health ramifications and continued impairment of the aquifer.

MDA is in the process of developing the SMP, which is being developed to protect the groundwater and surface water resources of the Greenfield Bench through improved management of pesticides. The goal of the SMP is to develop voluntary management practices that can be implemented by landowners. The focus of the proposed project is evaluation of pesticide movement to groundwater under different irrigation methods. In turn, water users and government agency personnel can use the information to make water management decisions aimed at protecting water resources and incorporate the results into the SMP. Related work by MDA, MBMG, DEQ, and EPA is cited in the application.

Technical Approach:

Teton County Conservation District seeks funds to evaluate transport of pesticides to groundwater. The proposed project will provide recommendations for irrigation practices to minimize pesticide transport to groundwater and surface water. In general, this will be accomplished by collecting data from two similar test plots representative of typical farms on the bench. The primary difference between the two test plots will be the application of irrigation water. One test plot will be irrigated by sprinkler and the other irrigated by flood techniques. The rest of the study design and data collection will be similar. The study design includes planting malting barley (which accounts for 65% of the crop grown on the bench) and applying the herbicide Assert™ on both test plots for weed control. Data collection will include: documenting background soil conditions prior to the study; collecting groundwater samples from a network of about 6 to 7 monitoring wells at each test plot; testing groundwater quality in the field using test kits; testing groundwater quality using laboratory techniques; characterizing aquifer conditions; conducting a water balance to quantify recharge and discharge relationships and determining the mass of Assert™ transported to groundwater.

The proposed project will provide unbiased scientific information useful to help protect groundwater resources. The results will help the district, MDA, and MBMG make informed recommendations for application of irrigation water to minimize transport of pesticides to groundwater. MBMG will perform the majority of technical activities under this proposal, with technical support from MDA and American Cyanamid (the manufacturers of Assert™). Technical activities will include installing

monitoring wells, logging lithologic conditions, measuring water levels, conducting tracer tests, and collecting water quality samples.

The proposal emphasizes evaluation of pesticide transport to groundwater. However, nitrates in the shallow aquifer are a major concern in the project area. Concentration of nitrates in groundwater at this location exceeds water quality standards. From a water quality perspective, the proposed project should be expanded to evaluate transport of nitrates, as well as pesticides, to groundwater. The impacts of using fertilizers could be combined with evaluation of pesticides since the two study areas would be setup to evaluate both potential contaminants.

Project Management

The district chairman will manage the project, with assistance from the district clerk. The district will act as the lead fiscal agency, provide the administrative support, and act as the liaison for landowners for dissemination of project results. A geohydrologist from MBMG will be the principle investigator. Project implementation is estimated to last approximately two years.

Financial Assessment:

Total cost of the proposed project is \$155,361. The following table breaks out the major costs of the RRGL grant.

RRGL Grant Costs

Administration	\$ 2,356
Professional	42,794
Laboratory	29,704
Construction	13,376
Travel	4,167
Supplies, tracer, etc.	7,603
Total Grant Costs	\$100,000

Estimated Total Project Costs \$ 155,361 RRGL Grant Share = 64%

Project unit and MBMG professional costs are reasonable and adequate to complete the project. A total of 80 hours at \$62.50 per hour are proposed for a contracted agricultural chemical specialist to support this project, which is reasonable assuming they are highly qualified and experienced. The proposed monitoring well costs, about \$1,000 per well, may be excessive considering another 1998 RRGL MBMG related project proposed \$330 per well in coarse-grained gravel and glacial outwash.

Apparently, the proposed costs are justified based on past MBMG experience that supports that drilling in the bench area can be very difficult and more expensive than other areas. Laboratory analysis unit costs are in line with typical pesticide and lithium bromide (tracer) analysis costs.

Project funding is in place with firm commitments from all funding sources, including American Cyanamid. However, because the number of involved parties is relatively large, additional efforts may be needed to manage each money source.

Benefit Assessment:

The project will collect scientific data that are needed by Teton County Conservation District, MDA, and Montana farmers to protect groundwater and surface water resources. In addition, the proposed project helps support MDA's ongoing efforts to minimize pesticide impacts on groundwater. Primarily this project will help water users modify their irrigation practices, which in turn will protect groundwater resources. Irrigation practices are integrated into the Sun River Irrigation Project management plan, and will be improved based on the results of the proposed project. A total of 82,000 acres of irrigated cropland is served by the Sun River Irrigation Project. In addition, there are over 450 residents in the study area and groundwater is their only source of drinking water.

Irrigation return flow water quality and groundwater quality discharging into return flow irrigation ditches is also a concern since these waters directly or indirectly flow into Freezeout Lake and Benton Lake from the Greenfields Bench area. Approximately 10,000 recreationists visit these two areas each year, and protecting water quality and the associated ecosystems is essential. Sound management of irrigation water in the Greenfields Bench area is important to help ensure there is no loss of habitat or adverse impacts to surface water resources.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of activities associated with the project.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Expansion of the project to include evaluation of nitrates is encouraged since data collection could be undertaken relatively easily and inexpensively using the same test plots. Additional funds would be necessary in order to complete a nitrate transport study. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 26

Applicant Name: Elk Meadow Ranchettes County Water District
Project Name: Water System Improvements

Amount Requested: \$ 100,000 **Grant**

Other Funding Sources: \$ 210,000 **TSEP**
 205,186 **SRF**

Estimated Total Project Cost: \$ 515,186

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

The Elk Meadows Ranchettes County Water District's original water system was designed to include

three water tanks. During the construction bidding process, all bids received exceeded the initial budget limitations. The district's engineering consultant modified the project design in order to reduce costs. The engineering consultant advised the district's board that operation of the revised project, "...would give the Board three to five years operation before the storage would be undersized and give them a chance to fund the construction of properly sized storage reservoirs."

Problem -The water storage capacity relative to domestic use is less than the minimum WQB-1 standards. The system is grossly undersized for adequate storage for fire flow and maximum daily use. It is also clearly demonstrated that it is extremely unlikely that any storage capacity is available during high demand periods (summer months). The system deficiencies cited in the preliminary engineering report include: improperly constructed wells; inadequate storage capacity; undersized mains; dead-end system configuration; insufficient hydrant assemblies; lack of booster pumping backup capability; lack of emergency power; lack of disinfection (chlorination) capability; uncontrolled use of water (lack of meters); zones of unusually high and low pressure; unreliable pump and tank controls; pressure surges, and low pH.

The preliminary assessment completed by DEQ indicates that the system's wells are at risk for influence by surface water. Two of the wells are considered to be in the "high risk" category, which mandates periodic microscopic particulate analysis for *giardia*, *cryptosporidium*, and other organisms associated with surface water.

Proposed Solution -The following information describes the proposed water system improvement project:

- Construction of additional storage capacity to provide acceptable water supply during peak demand.
- Construction of two new water supply wells to provide adequate water supply and protection from surface water contamination.

Technical Assessment:

Project Background:

The Elk Meadows County Water District is located west of Missoula near Huson. The proposed project consists of improvements to the Elk Meadow County Water District water supply and distribution system. These improvements will address specific deficiencies in the system that affect public health and safety.

The Elk Meadow County Water District currently uses two wells as a source of water supply. The two wells are located immediately adjacent to Six Mile Creek. DEQ, in conjunction with MBMG, has determined that the district's two water supply wells are at risk of being under the influence of surface water. The "Groundwater Under the Direct Influence of Surface Water Program" considers both wells to be in the "high risk" category, mandating periodic microscopic particulate analysis for *giardia* and *cryptosporidium* as well as other organisms associated with surface water.

In addition to the problems associated with the wells, the water storage capacity relative to domestic use is less than the minimum standards established by DEQ. The reservoirs are not adequately sized to provide required storage for fire protection. Fire protection is also compromised by undersized and dead-end water mains. The booster stations do not have back up pumping capabilities or back-up power and lack disinfection capability. Water use is extremely high and the water system is not metered.

Technical Approach:

The goals of this project are to relocate the wells to an area where the groundwater supply will not be under the influence of surface water and to make water system improvements to storage and distribution. The proposed project will achieve these goals. Two new water supply wells will be constructed such that the groundwater supply will not be under the influence of surface water. This will eliminate the immediate need for disinfection. A new 200,000-gallon storage tank will be constructed and an existing 13,000-gallon tank will be moved to a higher site to supplement existing storage in that area. The additional storage will meet current fire flow storage requirements and eliminate the most serious threat to property, health, and safety within the district. The existing booster station will be rehabilitated to include back-up pumping capabilities and piping for a chlorine injection system, should the need arise.

A water system analysis has been completed and deficiencies in the water system were identified. The deficiencies were mostly related to the system's inability to provide adequate fire protection. The analysis includes recommendations for improvements and provides engineering documentation supporting these recommendations. Recommended water distribution improvements include the connection of dead-end lines to create a looped system this will improve the system's ability to deliver the required fire flows while maintaining minimum pressures. Water meters will be installed at each residence.

Some questions were left unanswered concerning whether or not the water supply will require disinfection after the construction of the new wells. Additional discussion and analysis is needed concerning the recommended method of disinfection.

Project Management:

The applicant has identified the staff requirements necessary for successful project management. The board president/chief executive has designated a project officer who will be responsible for all official contacts with DNRC and will have the ultimate authority and responsibility for the management of the project activities and expenditure of funds. The district's chief financial officer will be responsible for the overall management and record keeping for DNRC funds involved in the financing of this water system project.

The selected engineering consultant will be assigned as the project manager and will be responsible for construction-related activities including preparation of final plans and specifications and construction administration. The district's water operator will assist with the construction administration.

Financial Assessment:

RRGL Grant Costs

Professional Services	\$ 1,900
Construction	98,100

Total Grant Costs	100,000
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Estimated Total Project Costs \$ 515,186 RRGL Share = 19%

The estimated cost for this project, including administration and a contingency is \$515,186. The

district has applied for a TSEP grant of \$210,000 and will be applying for a loan from SRF for the balance of the project costs.

The total budget is complete and reasonable. Water meters will be installed and users will be assessed based on actual water usage. The existing average month water use rate is \$47. The projected average monthly residential user rate after completion of this project is \$55.03, or 135% above the target rate of \$35.67 as established by DOC.

Benefit Assessment:

This project will provide benefits including resource conservation through the installation of water meters. Benefits to resource enhancement will be minimal. This project will primarily benefit the citizens of the district.

This project will eliminate the risk of contamination to the district's water supply wells via surface water influence. In addition, water distribution and storage improvements will enhance delivery of water to customers and improve fire protection. The addition of water meters will probably result in an overall decrease in water usage, thus preserving the longevity of the system. Meters will also allow the district to more accurately monitor water consumption.

Providing additional water storage will eliminate the risk of potentially "running out of water" during periods of high use and will provide adequate fire storage. This improvement will eliminate the most serious threat to property, health, and safety within the district. Modifications to the water distribution system will improve the ability to provide adequate fire flows while maintaining minimum pressures. Improvements to the booster station will provide standby reliability for the system. Under the current situation, the failure of the pump would result in a total shutdown of the system.

Environmental Evaluation:

This project will produce some short-term adverse environmental impacts that are normally associated with construction activities. Impacts include dust, water quality impacts and erosion control, noise, loss of vegetation, encroachment of noxious weeds, etc. Most of these short-term adverse impacts can be minimized with commonly used mitigation measures.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 27

Applicant Name: City of Glasgow
Project Name: Combined Sewer Separation Project

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 600,000 SRF
500,000 TSEP
400,000 CDBG

Estimated Total Project Cost: \$1,600,000

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Historical Information -The City of Glasgow is faced with increasing sanitation concerns, property damage claims, and environmental degradation caused by its combined sewage system, and is therefore making improvements to the existing sewage collection system. The city has recently completed the first phase (the Southside Stormwater Collection System) of a two-phase project to correct the problems caused by the combined sewage collection system. The second phase of the project will correct identical problems on Glasgow's north side.

Problem - The city's existing sanitary sewage collection system also serves as a storm drainage collection system for 270 acres of the city. Stormwater flowing into the sewage collection system causes raw sewage to chronically back up into the basements of local residences and businesses and to regularly overflow into the Milk River. The pollution from this overflow includes high TSS, BOD, nutrient, and fecal coliform concentrations. This pollutant load can have a severe impact on the receiving stream. As a result of these and other related problems, the City of Glasgow must separate the combined collection system and is therefore pursuing loan and grant assistance to complete the necessary construction improvements.

Proposed Solution - Construction of new storm drains, including stormwater detention, was determined to be the most feasible and cost-effective solution to the inflow problem. Due to the size of the project, the new stormwater management system is being constructed in two phases. The first phase included approximately 17,000 linear feet of new storm drains serving 150 acres of residential and commercial areas on the south side of Glasgow. The second phase includes approximately 11,000 linear feet of new storm drains. It will be constructed in 1999 and 2000 and will serve 120 acres of residential areas on the north side of Glasgow. Funding for Phase II construction is being pursued through the CDBG, TSEP, DNRC, and SRF programs.

Technical Assessment:

Project Background:

The project is located on the north side of Glasgow. This area has a combined sanitary-storm sewer system, which regularly becomes overloaded during storm events. Contaminated water backs up into individual homes, resulting in a significant public health hazard. Additionally, the high flows exceed the pumping capacity of the main sewage lift station and the wastewater overflows into the Milk River. This project is the second phase of a two-phase approach to resolving the storm

drainage problems in Glasgow.

Technical Approach:

The technical information provided supports the choice of the recommended alternative, which will address the identified problem in its entirety. A new storm drainage system including about 11,000 feet of storm drains and two detention basins is recommended for construction. The primary question surrounding the technical aspects of the project pertains to the two detention basins that are being proposed in a 300-acre drainage basins found upstream of the community. These basins are intended to hold and moderate storm flow to allow a downsizing of the storm drain conveyance piping. The basins will not be permanently filled with water as they are designed to drain at a controlled rate. Significant storm events exceeding the design storm (two-hour, five-year) will result in the filling of the detention basins, ultimately reaching a high level overflow pipe or spillway. At this point, the overflow will add to the base flow being released from the controlled discharge structure, which ultimately drains through the north side of the community. The storm water drainage system, primarily due to economic considerations, will not be sized to carry a storm event in excess of the two-hour, five-year event.

While the cost-effectiveness of this proposal is acceptable, the risk hazard associated with construction of two relatively large impoundments upstream of the city has not been adequately addressed. The design of these basins, because of their hazard potential, comes under the authority of the DNRC dam safety program. The technical design and project construction may become significantly more complicated and expensive when applying special measures to ensure that a low risk potential exists with the water impoundments. An adequate budget was not presented in the application to address these concerns, but the loan portion of the project-funding package can be increased to provide for additional construction costs, if needed. Alternatively, the basins could be abandoned and a larger storm sewer system built. The costs for this option are not significantly greater than the estimated project costs, thus this option is also financially viable.

Project Management:

The applicant has assembled a reasonable project management and implementation plan. The funding package is highly dependent on grant assistance (62% of the total project) derived from competitive grant programs. All of these applications are in the evaluation process, so no firm funding has been committed to date. Consequently, a certain degree of risk is present. The city has a qualified staff to manage the project and the engineer of record has prior experience in the community with a very similar project. Costs for project administration, engineering design, and construction management are within the expected range for a project of this magnitude.

Financial Assessment:

RRGL Grant Costs

Construction	\$ 100,000
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Total Grant Costs	\$ 100,000
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Estimated Total Project Costs \$ 1,600,000	RRGL Grant Share = 6.25%
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The financial feasibility of the project is documented and presents a viable solution to the problem. Costs are appropriate, although grant management costs appear high and construction cost estimates for detention basins may be low. Adequate flexibility exists in the budget and funding sources to cover possible cost overruns. Funding sources are primarily derived from competitive grant programs with a certain degree of risk. Funds are not yet committed to this project from any

identified sources.

Benefit Assessment:

The proposed project will result in significant public benefit through the reduction of storm water discharges to the sanitary sewer system. The high flows in the sanitary sewer system during storm events have resulted in sewer backups and property damage to a number of residences in the community. Strong local support was expressed in the application with letters from local residents to correct the problem. Additional support was provided by both local and state regulatory officials concerned about the public health and environmental hazards associated with raw sewage discharges and sewage backed up into residences. Surveys and meetings held and documented in the application also show public support and benefit. The improvements allowed by this project will be permanent, ongoing, and will result in a quantifiable reduction in health risk and improvement for the environment.

The construction of storm sewers will significantly reduce the flow that presently enters the sanitary sewer system, ultimately resulting in overflows from the main sewage pump station into the Milk River. This project should eliminate the bypassing of raw sewage into the Milk River and serve to protect this renewable resource. Additionally, the detention of storm water at the head of the drainage basin will help to settle suspended solids and improve the quality of storm water that enters the river.

Environmental Evaluation:

The primary environmental concern pertains to the impoundments located above the community and the risk associated with a dike failure. Specific construction techniques and permitting by DNRC are necessary to ensure that the impoundments represent minimal safety risk. The engineer for the project is familiar with these requirements and indicated that they would be addressed in design. Additional costs could be covered with loan assistance from the SRF program, if necessary. An additional environmental concern pertains to the construction of the upper impoundment to be located on property owned by the local airport authority. The collection of surface water increases the potential to attract waterfowl to the area. Typically airports strive to avoid having birds near runways and this basin could increase birds in the area. The airport authority did write a letter in support of the project; apparently, they believe that the bird situation is tolerable.

Funding Recommendation:

DNRC recommends grant funding in the amount of \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws and shall ensure the project is designed in accordance with DEQ requirements.

Project No. 28

Applicant Name: City of Columbia Falls
Project Name: Sewer Treatment Plant Upgrade

Amount Requested: \$200,000 Grant

Other Funding Sources: \$ 500,000 TSEP
2,577,000 SRF

Estimated Total Project Cost: \$3,277,000

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - In 1997 the city became increasingly concerned about the ability of the sewer treatment plant to store sludge for extended periods and the future feasibility of continuing sub-surface injection as a method of disposing of sludge. The city initiated a facility study to examine the entire sewer to determine its adequacy for the future.

Problem - The facilities plan revealed that the treatment plant has the following deficiencies:

- a. The sludge storage basin has significant leakage of an estimated 3,333 gallons per day. If this leakage were repaired, the basin would not have sufficient capacity to store the sludge during the winter period.
- b. The sludge storage basin is very difficult to empty.
- c. The treatment process is degraded by the presence of *microthrix* bacteria.
- d. The aeration basin chlorination system cannot be used in cold weather.
- e. The digester cannot be aerated due to foaming. This prevents the sludge from being properly stabilized.
- f. The feed system for tertiary treatment does not provide proper flow, occasionally fails, and does not have a backup.
- g. The return activated sludge pumps are oversized. This excess pump capacity interferes with efficient sludge management.

Additionally, Columbia Falls is a rapidly growing area. It is likely that land area now used for sludge disposal will probably be developed and be unavailable. The city has had difficulty-finding producers willing to use sub-surface injection as a method of fertilizing crops. The long-term feasibility of continuing sub-surface sludge injection is improbable.

Proposed Solution - The proposed project will:

- a. Construct a dewatering facility to produce solid sludge that will give the city more options on disposal;
- b. Construct digester improvements so the sludge is stabilized to at least Class B standards; and
- c. Install process improvements to reduce the influence of *microthrix* bacteria, improve the tertiary process, and improve the handling of sludge within the plant.

Technical Assessment:

Project Background:

Wastewater generated within the community of Columbia Falls is centrally collected by gravity and pumped to a mechanical wastewater treatment plant. This plant was upgraded in 1983. Phosphorous removal equipment was added in 1988. In 1997 the community became concerned with sludge storage and handling facilities and retained an engineering firm to conduct a facility plan. In particular, the sludge storage basins leak and the digester performance is poor due to foaming and other process limitations. Other plant problems include inadequately protected chlorine facilities, no flow pace control for the feed pumps, and oversized return activated sludge pumps. Aeration basin improvements were also an identified need, but will be addressed in a second phase of the overall project.

There is no enforcement action being taken by DEQ at this time, but DEQ wrote a letter noting that the leaking sludge basin is a violation of the Montana Water Quality Act and enforcement is possible. The leaking sludge may be polluting the Flathead River. Substandard digester performance produces a poor quality (less stabilized) sludge that increases public health concerns during land application and storage and may prohibit certain disposal alternatives. In addition, the community is concerned with losing the existing sludge disposal land application sites due to residential development. The city needs to produce a sludge (dewatered and well stabilized) that provides more flexibility for disposal.

The collection system consists of five lift stations. Two of the lift stations are in poor condition. One requires new controls and the other requires complete reconstruction. Otherwise, the collection system was determined to be in adequate condition.

Technical Approach:

The facility plan evaluated several alternatives for addressing each of the problems with the treatment facility and collection system. The recommended approach to solving the problem is to add sludge dewatering facilities, a new sludge storage pad, and a new digester, improve the chlorine facility, and add flow place capacity for the alum feed pumps. In addition, the controls for Lift Station 4 would be replaced and a new lift station would replace Lift Station 5. The proposed approach would completely eliminate the leaking sludge storage basin; provide a thicker, more stabilized sludge and thereby increase disposal alternatives; and in general improve the treatment efficiency of the plant and the reliability of the collection system. The proposed solution is complete and well documented. The project schedule appears to be appropriate.

Project Management:

City personnel will manage the project with experience in the management of grant and loan projects. The city manager will have overall management authority and will coordinate and manage all aspects of the project including: acquisition of funds, supervision of the finance manager in the disbursement of funds, and supervision of the engineer. The finance manager will perform the day-to-day administrative functions associated with the management of the project as they relate to finance and accounting. The city's water and sewer superintendent will be responsible for technical aspects of the project and coordination with operations. The applicant proposes to conduct progress meetings to keep all parties informed. Newsletters along with periodic public meetings at key milestones would be used to keep the general public informed. Given that this project will largely be constructed in the footprint of the existing facilities, implementation will be less complex

from a permitting and easement perspective.

Financial Assessment:

RRGL Grant Costs

Administration/Legal Costs	\$ 967
Engineering	7,852
Construction	91,181

Total Grant Costs	\$100,000
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Estimated Total Project Costs \$3,277,000 RRGL Grant Share = 3%

The project will be conducted in two phases. Funding for the first phase is being requested. The estimated cost of Phase I is \$3,277,000 and is proposed to be funded with a \$500,000 TSEP grant, a \$200,000 RRGL grant, and \$2,577,000 in SRF funds. However, only a \$100,000 RRGL grant is being recommended with the remainder being picked up by the SRF program. Approximately \$230,000 of the total project costs will go toward the construction of lift station improvements, and the remaining portion of the total will go toward constructing dewatering/sludge handling facilities and a new sludge digester. The proposed user cost is approximately \$40.00/month, which exceeds the target rate established by DOC. Estimated construction costs appear reasonable and consistent with similar projects. The SRF Program has written a letter to the city confirming the availability of SRF funds.

Benefit Assessment:

A point source of groundwater and surface water pollution will be eliminated with this project when the sludge storage basin is taken out of service and replaced with sludge dewatering equipment and a new sludge storage facility. This will improve and protect the water quality in the Flathead River. In addition, dewatering the sludge will reduce the quantity of sludge handled by making it thicker. This will reduce the risk of spillage in subsequent handling and transport of sludge. Dewatered sludge also increases the alternatives available for subsequent disposal and handling, thereby increasing the potential for continued reuse of the sludge as a valuable renewable resource (soil amendment and fertilizer).

The new sludge digester will improve the quality of sludge and thereby protect public health and also further ensure the continued reuse of the sludge as a soil amendment and fertilizer. It should be noted that it is specific EPA policy through section 503 of the Clean Water Act to consider sludge a renewable resource and encourage the beneficial reuse of sludge as a soil amendment and fertilizer. Improvements to the lift stations will improve system reliability and protect public health by reducing the risk of collection system failure and subsequent sewage backup into homes. Other improvements to the wastewater treatment plant will improve plant efficiency and effectiveness, which will improve effluent quality. Improved effluent quality will improve the water quality of the Flathead River. This project will help avoid a possible DEQ enforcement action of discharge permit violations.

Environmental Evaluation:

The proposed improvements to the treatment plant will be completed within the footprint of the existing plant and will have no adverse impact on the environment. This project will produce the typical short-term adverse environmental impacts that normally are encountered during utility

construction. The proposed improvements will have a net positive impact on the environment by eliminating the leakage of sludge in the sludge storage basins and by reducing the volume of sludge handled and transported to the sludge application site.

Funding Recommendation:

DNRC recommends grant funding in the amount of \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws and shall ensure the project is designed in accordance with DEQ requirements.

Project No. 29

Applicant Name: Montana Department of Natural Resources and Conservation
Project Name: Precipitation Relationships for Montana Design Guidelines

Amount Requested: \$ 67,000 Grant

Other Funding Sources: \$46,350 USGS
10,000 DNRC

Estimated Total Project Cost: \$ 123,350

Amount Recommended: \$ 67,000

Project Abstract: (Prepared and submitted by applicant.)

Locally owned dams play a significant role in the water supply for the state of Montana. Many of these dams are used for storing irrigation water as well as for municipal and commercial supplies. In addition, many reservoirs are used recreationally for swimming, boating, and fishing. Unfortunately, the many benefits derived from reservoirs come with risk associated to public safety below dams. The capacity of a dam's spillway plays a significant role in reducing the public risk. If a spillway is not adequate, the potential exists for water to spill over the dam face, resulting in an uncontrolled flood wave that can destroy life and property.

The proposed guidelines will provide consultants throughout the state with specific information needed to analyze the adequacy of spillways. At this time, precipitation for extreme events, needed to assess spillway adequacy, can only be determined accurately at a point. Reduction of this precipitation for basin area will be assessed.

In addition, extreme precipitation events are derived from mean annual precipitation amounts. Presently, no government agencies have the resources to serve as clearing-houses for this information. Publication of detailed maps showing mean annual precipitation amounts would enable engineering consultants to assess extreme precipitation events without relying on the various government agencies to supply values.

Development of these guidelines will improve the estimates of design storms for all dam-safety investigations in Montana. If only one existing spillway is found adequate as a result of this study, the economic savings could be enormous. Additionally, the need for new spillways will result in

future grants being submitted. Hence, due to these design guidelines, the potential exists for future savings in coal trust tax funds.

Technical Assessment:

Project Background:

In 1993, the Water Resources Division of DNRC received a renewable resources grant to fund a study related to the examining storm events in Montana for spillway design for high-hazard dams in the state. This study, entitled *Characteristics of Extreme Precipitation Events in Montana*, had two phases. The first phase analyzed extreme precipitation events and determined a frequency of occurrence for given precipitation depths. The second phase looked at precipitation distribution including where the peak precipitation occurs within the storm.

The study proposed in this application will analyze the aerial extent of storms in Montana and determine the related probability of occurrence. This information, along with the information gained from the first study, will enable engineers for dam owners to select more efficient spillway capacities for dams. The studies will localize the design parameters to Montana conditions and will be used in determining appropriate spillway capacities for high-hazard dams.

Dam spillways are currently analyzed based on the capacity to pass the Probable Maximum Flood or a fraction thereof. This method of analysis is completed with storm data based on a point value of storm depth for a given basin. Probable Maximum Floods are often controversial because they are significantly higher than any historical floods, and the method is not probability based. Spillway standards have a significant bearing on the economic feasibility of continued operation of existing dams.

Technical Approach:

The proposed study goals are to develop a probability-based method to reduce the depth-area-duration design storm from a point value to a drainage basin value and to publish detailed mean annual precipitation maps for the state of Montana that are necessary for spillway analysis. Adjusting the design storm to a probability-based basin average value will provide realistic criteria for analyzing spillway capacity requirements. Publishing mean annual precipitation maps will provide access to the information for consultants to use in spillway analysis. The data currently exist in a digital format that is not accessible to most consultants. The data are available to DNRC and NRCS, but these agencies are not set up to act as a clearing-house for this information.

The proposed project will be completed as a cooperative project between USGS and DNRC. Specific tasks have been identified to complete the project including compiling existing storm data, developing methods for adjusting compiled depth-area data for various storm periods, and publishing the study results in the USGS Water Resources Investigations Report. The applicant also proposes to examine whether U.S. Weather Service NEXRAD radar data can be used to develop depth-area-duration data for Montana, and to publish detailed average annual precipitation maps for the state of Montana.

Publication of the annual average precipitation maps is planned to be completed by September, 2000. Publication of the study is scheduled for 2001.

Project Management:

The DNRC Water Operations Bureau office in Helena will provide project management.

Financial Assessment:

RRGL Grant Costs

Consultants (USGS)	\$ 46,350
Printing/Publication	20,650

Total Grant Costs	\$ 67,000
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Estimated Total Project Cost \$ 123,350 RRGL Grant Share = 54%

RRGL study costs include contracted services (USGS depth-area-duration analysis) and printing and publication costs.

Benefit Assessment:

Completion of the proposed study and publication of results will provide professionals with probability-based design-storm data for use in completion of dam spillway evaluations. Refining the design review process for spillway stability analysis using probability-based design storms will likely result in preventing the unnecessary reconstruction or abandonment of existing water storage facilities.

Environmental Evaluation:

No adverse environmental impacts are associated with this study.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$67,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 30

Applicant Name: Sweetgrass Community County Water/Sewer District
Project Name: Wastewater Treatment Facility Rehabilitation/Upgrade

Amount Requested: \$100,000 Grant

Other Funding Sources: \$ 10,000 Project Sponsor
213,000 TSEP
55,000 SRF
253,000 CDBG

Estimated Total Project Cost: \$ 631,000

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - Sweetgrass is an unincorporated community located on the border between the United States and Canada approximately 90 miles north of Great Falls, Montana, on Interstate Highway 15. A rural improvement district was formed in 1963 to construct a water and sewer system. No significant improvements have been made since then, except for minor expansions to accommodate businesses. Sweetgrass is on the priority list issued by DEQ for major sewer rehabilitation.

Problem - The existing wastewater treatment lagoon does not meet current state standards (Circular WQB 2) in several areas: 1. Number of lagoon cells: Sweetgrass' system has one cell. State standards require a minimum of two cells for a lagoon system with a daily influent flow less than 25,000 gpd. 2. Inlet design: State standards require that the inlet point be located at the midpoint of lagoon width and 10 feet from the toe of the dike. 3. Maximum seepage rate: Based on the reported lack of effluent discharge, seepage from the lagoon is in excess of the maximum rate of 6 inches per year. Discharge of treated wastewater from the lagoon has not been recorded since the inception of the facility's current MPDES permit (MT-580010). However, on occasion leakage of the effluent has been noted. It is assumed that there has not been a discharge because the lagoon is not sealed and wastewater flow in excess of evaporation is being lost to seepage through the lagoon bottom and dikes.

Proposed Solution - The preferred alternative solution identified by the facility plan consists of expanding the existing lagoon system to two cells, along with a new inlet, and relining the existing cell, which would bring the existing lagoon system into compliance with state standards. A two-cell system would only minimally impact the existing shallow saline lake adjacent to the lagoon.

Technical Assessment:

Project Background:

Sweetgrass is an unincorporated community located on the United States-Canadian border 90 miles north of Great Falls, Montana. A rural improvement district was formed in 1963 to construct a water and sewer system; no improvements to the sewer system have been made since that time. Sweetgrass is on the DEQ priority list for sewer system improvements.

The existing wastewater treatment system consists of a single-cell facultative (non-aerated) sewage lagoon that does not meet the current state standard that requires a minimum of two treatment cells for facultative systems. The lagoon is also experiencing a significant amount of leakage at an estimated rate well above the allowable standard. Inadequately treated sewage leaks into the underlying soil and groundwater. Finally, the lagoon system-piping configuration allows short-circuiting of wastewater, compromising system treatment efficiency.

This project has been initiated to correct these deficiencies to serve the existing user population and expected growth due to plans for the construction of a new port of entry at Sweetgrass.

Technical Approach:

The immediate goal of this project is to bring the community's wastewater treatment system back into compliance with DEQ regulations. The applicant also states, "The purpose of the project is to provide long-term resource management to preserve water quality, conserve water, and protect the

quality of soils and groundwater." The applicant performed a detailed alternative analysis. The selected alternative includes expanding the existing lagoon system to two cells and improving inlet and outlet piping to prevent short-circuiting in the system. This option will meet system needs, allows greater ability to handle variance in flows, requires minimum operation and maintenance, and is the most cost-effective solution.

The selected alternative is feasible and will meet the goals of the project and DEQ standards. The schedule provided for the project is realistic and takes funding constraints into consideration. The various regulatory agencies have been contacted, and there do not appear to be any major compliance issues.

Project Management:

A project management plan has been provided in the application. Personnel have been identified to manage the various funding sources, oversee the project engineer, and oversee the construction contractor. A funding plan has been developed that includes the funding sources listed above.

Financial Assessment:

RRGL Grant Costs

Construction \$ 100,000

Total Grant Costs \$ 100,000

Estimated Total Project Cost \$ 631,000 DNRC Grant Share = 15.8%

Sweetgrass users currently pay an average of \$21.80 for water and \$10 for sewer per month. The combined average monthly water and sewer rate is \$31.80, which is 135% of the DOC target rate of \$23.40. If the proposed funding package is approved, the average combined water and sewer rate will increase to \$40.95, which is 175% of the target rate.

The budget appears to be adequate if all components of the funding package are approved.

Benefit Assessment:

This project will provide adequate treatment of the district's wastewater and eliminate leakage from the existing lagoon, resulting in protection of human health and preventing contamination of groundwater and surface water. Reducing risks associated with the existing lagoons will provide a direct benefit to citizens. Protection of the groundwater resource will benefit the community. The benefits provided by this project are long-term and can be quantified to a degree by measuring the quality of effluent that will be produced by the proposed system.

This project will not make a significant contribution toward renewable resource enhancement.

Environmental Evaluation:

There do not appear to be any long-term adverse environmental impacts associated with this project.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 31

Applicant Name: Town of Sheridan
Project Name: Water Supply Improvements

Amount Requested: \$ 30,000 Grant

Other Funding Sources: \$ 10,400 Project Sponsor

Estimated Total Project Cost: \$ 40,400

Amount Recommended: \$ 30,000

Project Abstract: (Prepared and submitted by applicant.)

The town's water system was originally constructed in 1915. A major project was completed in 1990 that provided the town with four new wells. The project was necessary to comply with a state mandate to discontinue use of its then surface water supply from Indian Creek.

Problem – A recent engineering study identified the following deficiencies.

- Insufficient water supply
- Undersized, old, leaking distribution mains
- Undersized, old, wooden transmission main
- Need for valving to maximize storage
- Additional water storage
- Dead-end distribution mains

The number one problem is that the town often runs short of water due to inadequate supply from its wells. In addition, the town's drinking water is exposed to the potential for contamination, and public health and safety is threatened due to lack of fire protection.

Proposed Solution - The town intends to address the problems in a phased manner. The first phase involves locating a potential new water supply with test drilling and testing existing Well 4. The town feels that once its supply problems are addressed, it can then proceed with the remainder of the improvements. The project proposed for this application includes only test drilling for a new water supply well (\$30,400) and test pumping and analyzing the town's existing Well 4 (\$10,000).

Technical Assessment:

Project Background:

An engineering study completed earlier this year for the Town of Sheridan found the following problems with the water system: (1) insufficient water supply; (2) undersized, leaking water mains; (3) insufficient valving for storage control; (4) inadequate water storage; and (5) dead-end distribution mains. The Town of Sheridan has chosen to address its water supply problems as the first phase of its needed improvements.

Originally, the Town of Sheridan used Indian Creek as its public water supply. Then, in 1990, four new wells were constructed to replace the Indian Creek surface water supply, which was determined to be inadequate. Now the four public water supply wells do not provide sufficient quantity to satisfy the community's demands and state standards. Wells 1 and 2 are both screened within the shallower of two aquifers and appear to be influenced by surface water through recharge from the nearby irrigation ditch. Well 4 is a deep well, but it was not properly constructed for use as a public water supply. Two separate aquifers were intercepted by the well, and perforation of the casing at each interval without the use of a packer allows aquifer mixing. The well is also over-pumped to the extent that air is drawn into the aquifer where the upper perforations are exposed during pumping. Only Well 3 has proven to be a fully reliable groundwater source that can be consistently used by the town.

Technical Approach:

The proposed project has two main goals. The first is to solve an air problem and construction problem in Well 4 through installation of a packer between the two aquifers with the hopes of putting this well into full-time production, and (2) to develop a new 600 gallons per minute (gpm) water source. Five options were considered for developing a new water source.

The alternative selected is construction of a well in the deep alluvial aquifer on the east side of town, with possible drilling into the underlying crystalline rock at the same time. An additional 600 gpm of flow is desired for the town's water supply from this well. State regulations require pump-testing at 1.5 times the design flow, so the well would need to be pump-tested at 900 gpm. Although the hydrogeological studies indicate that this flow may be attainable, actual well quantity can not be predicted with complete certainty.

At this time, the exact well site has not been chosen, but will likely be located on private property. Before a well is drilled, an easement document will be drafted that allows for purchase of the well if adequate water quantity is found. No problems are expected with obtaining this easement agreement. The project schedule proposes to drill the new well and renovate Well 4 during the months of July through August 1999.

Project Management:

The Sheridan Town Council will be responsible for the overall project management. Along with the mayor, the town council will help keep the project on schedule and assure that all administrative and record-keeping tasks are completed for the project. The town clerk will be responsible for the financial record keeping for the proposed project and all other necessary paperwork. The project engineer will prepare the final design plans and specifications and will be responsible for assisting the town clerk in coordinating the project with DNRC. The project will be implemented as soon as DNRC funds are available.

Financial Assessment:

RRGL Grant Costs

Final Engineering	\$ 4,700
Construction	23,400
Contingency	1,900
Total Grant Costs	\$ 30,000
Estimated Total Project Costs	\$ 40,400 RRGL Grant Share =74%

All project funds will be directed toward activity costs. Due to the simplicity of the project, administrative costs are not expected to be significant. Personnel and office costs are expected to be minimal and will be absorbed into the Town of Sheridan's normal water system operating expenses. Any minor legal expenses would also need to be handled by the town. Cost estimates for the exploratory drilling and aquifer testing appears to be reasonable. A 600-foot well is conservatively assumed in the cost estimate. However, should the well need to be deeper, the Town of Sheridan has the reserves to cover this additional cost. The budget's 12% contingency, or \$3,300, is acceptable given the uncertainty present when drilling a well.

The town has adequate reserve funds to fully cover the cost of this project, but would like to maintain a sufficient reserve to provide matching funds for future phases of its water system improvements. A resolution authorizing the town's \$10,400 commitment has already been passed. The Town of Sheridan will begin its water supply project once RRGL funds are available.

User rates for the 709 Sheridan residents served by the water system will not be affected by this project. The Town of Sheridan realizes that a significant rate increase will be required in the near future to complete its other necessary water system improvements. The town feels that the rate increase will be easier to impose in one lump sum rather than a series of smaller increases. The water system currently services a total of 350 residential hook-ups with an average monthly rate of \$15.00 per hook-up.

Benefit Assessment:

This project will greatly benefit the 350 households in Sheridan, Montana, by increasing the quantity of the town's public water supply to meet the community's demands. An existing water supply (Well 4) will be further developed in addition to the establishment of a new water source. If a packer is successfully installed in Well 4 to separate the two aquifers penetrated by the well casing, the current air problem in this well can be eliminated and the well can be put to beneficial use. Use of the packer will also meet well drillers' requirements designed to protect individual aquifers. If a new 600 gallons per minute (gpm) well is drilled, the town will have adequate water quantity to meet its required domestic, irrigation, and fire flow needs well into the future.

Environmental Evaluation:

No adverse environmental impacts are expected to result from this project provided the well driller abides by the state's well drillers' regulations. All unused materials must be removed from the site in order to protect the well from pollution during construction. Materials must be pumped from the well to a place where it will not cause damage to property or create a nuisance.

Funding Recommendation:

DNRC recommends grant funding in the amount of \$30,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 32

Applicant Name: Corvallis County Sewer District
Project Name: Upgrade & Expansion of Wastewater Treatment Facility

Amount Requested: \$100,000 Grant

Other Funding Sources:

\$ 408,260	TSEP Grant
242,760	CDBG Grant
40,000	SRF Loan
10,000	EPA Advance of Allowance
15,500	Local Reserves

Estimated Total Project Cost: \$816,520

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

Historical Information- Corvallis' wastewater collection and treatment facilities were constructed in 1981-82 and consist of a 8-inch PVC gravity collection system, central lift station, and force main to a two-cell aerated lagoon northeast of town. Treated wastewater is disposed of through infiltration/percolation (I/P) beds.

Problem - The community of Corvallis has experienced significant growth and development since the facility was constructed in the early 1980s. Design population for the current facility is 650 people, while current estimated service population is 678. Design average flow rate is 51,000 gpd, while the current measured flow rate is approximately 68,500 gpd. The facility is experiencing hydraulic and organic loadings that are significantly beyond its design potential. There is also a considerable volume of accumulated solids in both of the treatment cells and problems with existing aeration equipment.

Corvallis implemented a moratorium on new sewer hook-ups in 1994 in order to control loading the facility. The moratorium has effectively stalled growth in the community. Groundwater monitoring upstream and downstream of the I/P beds indicates that the facility is causing nitrate contamination in the groundwater. Often the concentration in downstream wells exceeds the EPA maximum contaminant level for nitrate of 10 mg/l. DEQ has informed Corvallis that continued exceedances could result in state enforcement. Expansion of the facility will trigger a review from DEQ for compliance with the state's non-degradation requirements.

Proposed Solution -The recommended alternative is to replace the existing aeration system with

static tube diffusers, augmenting the blowers from two 7 Hp blowers to two 20 Hp units. The project includes removal and land application of accumulated sludge, construction of an additional lagoon cell for treatment and storage, constructed wetlands treatment for nitrogen removal, and expansion of the I/P beds. Compliance with non-degradation will be accomplished by nitrogen removal through the constructed wetland system.

Technical Assessment:

Project Background:

The central sewer system consists of a standard gravity collection system that transports domestic wastewater generated in the community to a lift station on the northwest end of town, which then pumps the wastewater to a treatment facility northeast of the town. The treatment facility consists of two mechanically aerated lagoons with effluent disposal to groundwater via rapid infiltration ponds. The community has experienced significant growth. The current facilities were designed for 650 people and the current population of the town is 678 people. The existing wastewater treatment facility has reached its design capacity. There are sludge accumulations within the corners of the ponds and the existing aeration facilities are not functioning efficiently. In addition, groundwater quality monitoring has documented increases in the nitrate concentrations. The groundwater nitrate concentration sometimes exceeds the state drinking water standard of 10 mg/l. DEQ has informed the community that continued exceedance of the standard could result in state enforcement. The district implemented a moratorium on new sewer hook-ups in 1994 in order to control loading to the treatment facility.

Technical Approach:

The immediate objectives of the proposed project are to expand the capacity of the current facilities, improve treatment efficiency, and to restore the capacity for growth. Meeting these objectives would improve groundwater quality, help the community avoid potential state enforcement, allow lifting of the sewer moratorium, and reduce odors. A secondary benefit may be improved surface water quality in the Bitterroot River. The facility plan reviewed several alternatives and recommended upgrading the two existing mechanically aerated ponds, expanding the rapid infiltration ponds, adding a storage pond, and adding wetland treatment cells for nitrogen removal. In addition, sludge accumulations in the existing aerated cells would be removed.

Project Management:

The project management staff will include the district board president, the district clerk/treasurer and the services of the district's consulting engineering firm. The clerk /treasurer has experience with administering construction grant funds as well as experience with revenue bonds, but no experience with TSEP, DNRC, and CDBG funds. The consultant has good experience with all of these programs. The clerk and consultant appear to be well qualified with sufficient manpower to effectively manage the project. The consultant will provide progress reports and presentations at regularly scheduled board meetings.

Financial Assessment:

RRGL Grant Costs

Construction	\$ 100,000
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Total Grant Costs	\$ 100,000
Estimated Total Project Cost	\$ 816,520 RRGL Grant share 12%

The estimated cost of the project is \$816,520 and is to be funded with a \$408,260 TSEP grant, a \$100,000 RRGL grant, a \$242,760 CDBG grant, a \$10,000 EPA planning grant, \$15,500 in local reserves, and \$40,000 in SRF funds. The current user rate is \$9.37/user/month for debt service and operation and maintenance. The facility plan estimated the Median Household Income to be \$15,100 based on the MHI data from Hamilton and Stevensville. Based on this MHI, the target rate was calculated to be \$9.01/user/month, or 4% lower than the current user rate. Based on the assumed funding scenario and the project cost presented in the facility plan, the proposed user cost is \$14.34/month, which exceeds the target rate established by DOC by approximately 60%. An income survey performed in early 1998 shows that 71% of Corvallis resident's income is below the low-to-moderate income level.

All necessary costs appear to be included and the costs appear to be reasonable and consistent with other projects of a similar nature. The SRF program has written a letter to the city confirming the availability of SRF funds.

Benefit Assessment:

Groundwater monitoring of nitrates has documented a contamination problem due to the current wastewater treatment facilities. This groundwater eventually flows into the Bitterroot River. Widely accepted calculations have demonstrated that quantifiable and measurable improvement to groundwater quality would be achieved with the implementation of this project. Some level of public health protection would occur with reduced groundwater pollution. The project supports the National Pollution Discharge Elimination Program and the Montana Pollution Discharge Elimination Program by improving the quality of wastewater discharges. To some extent, the project supports ongoing efforts by area states to reduce the nutrient load in the Clark Fork River drainage by reducing non-point nutrient loads (groundwater) to the Bitterroot River. The constructed wetland would provide some additional wildlife habitat. There are no existing EPA or DEQ enforcement actions, but groundwater quality monitoring has identified potential violations of state water quality laws that could result in enforcement action. The project allows the community to continue to grow.

Environmental Evaluation:

The proposed improvements to the treatment plant will largely be completed within the footprint of the existing plant and will have no adverse impact on the environment. Only an additional three acres of farmland would be disturbed. The proposed improvements will have a net positive impact on the environment by improving wastewater treatment and thereby reducing the documented groundwater contamination caused by the current treatment plant.

Funding Recommendation:

DNRC recommends grant funding in the amount of \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws and shall ensure the project is designed in accordance with DEQ requirements. DEQ concerns regarding nitrogen removal and nondegradation must be addressed prior to project funding.

Project No. 33

Applicant Name: Town of Geraldine
Project Name: Wastewater Improvements

Amount Requested: \$ 50,000 Grant

Other Funding Sources: \$ 269,007 CDBG Grant
300,000 TSEP Grant
17,000 Local Funding
175,000 SRF Loan

Estimated Total Project Cost: \$811,007

Amount Recommended: \$ 50,000

Project Abstract: (Prepared and submitted by applicant.)

Historical Information – Geraldine's sewer system serves approximately 297 people on 116 residential and 12 commercial connections, which includes the Geraldine School. The wastewater lagoon was constructed in the early 1950s. Wastewater from the Town of Geraldine is presently being collected and treated by a single-cell lagoon system, which discharges to a roughly defined drainage ditch, eventually flowing into Flat Creek.

Problem - Over the years, Geraldine's wastewater system has generally complied with the required parameters of its MPDES discharge permit, with the exception of BOD. A trend of increasing violations of BOD has occurred. The violations are likely caused by the accumulation of sludge in the lagoon. The town hired Neil Consultants to prepare a wastewater facility plan and the following deficiencies were also noted within the system:

1. Inadequate lagoon volume.
2. Lagoon has severe erosion along interior dikes.
3. Discharge structure is deteriorated beyond simple repair.
4. No primary flow measuring device.
5. Lagoon performance limited by having only one cell.
6. A significant volume of sludge has accumulated in the treatment cells.
7. Fencing is needed to prevent access to the site by the public.

The problems in the system result from the use of outdated technology and components, which have outlived their useful life.

Proposed Solution - The engineer's recommendations include the construction of an additional 4.2-acre treatment cell and installation of a wind-driven mixer, new piping, and discharge structures. In addition, the existing cell will be rehabilitated. The rehabilitation work includes the removal of the sludge, restoration of the dike slopes, and installation of a synthetic liner. A television inspection program involving cleaning, TV taping, and a summary report are also recommended to assist in the implementation of a long-term capital improvement program for the community to address collection system needs.

Technical Assessment:

Project Background:

The Geraldine system consists of a gravity collection system and a single-cell facultative lagoon. The lagoon discharges to a roughly defined drainage ditch, which eventually flows to Flat Creek. The lagoon system treats combined flows consisting of domestic wastewater and groundwater discharges and runoff. The treatment system is old. Accumulated sludge needs removing and the interior lagoon banks are severely eroded and need repair. There is also no primary flow-measuring device to accurately measure system flows. The combined flow is 350 gallons per capita day (GPCD). Typical domestic wastewater flows are 80-120 GPCD. The discharge has failed the BOD permit limit nine times between June 1996 and October 1997.

Technical Approach:

The goal of this project is to improve wastewater treatment by improving treatment capacity and efficiency. The expanded lagoon system will meet the goals of the project. The deficiencies listed above will be remedied with completion of the project except for elimination of clear water flows in the system. It was shown to be more cost effective to expand the treatment capacity of the treatment system than to reconstruct the collection system and construct a storm water discharge system.

Proposed improvements include construction of a new lagoon cell and reconstruction of the existing cell (sludge removal, bank restoration, and lining). A wind-powered mixer is planned for the new cell. A collection system study is also recommended to locate and repair broken and leaky mains to reduce system infiltration.

Proposed improvements should remedy system discharge violations. Improvements are planned to serve the projected 20-year population.

Project Management:

The project management team proposed for this project consists of the mayor, town council, clerk/treasurer, town attorney, an administrative consultant, and the engineer. The administrative consultant will be responsible for most grant and loan administration tasks.

Town officials and their consultants are familiar with public bidding and procurement statutes and will advertise and bid this project accordingly. Wage and labor standards will be strictly enforced.

Financial Assessment:

RRGL Grant Costs

Wastewater System Construction \$ 50,000

Total Grant Costs \$ 50,000

Estimated Total Project Costs \$ 811,007 RRGL Grant Share = 6.2%

The estimated cost of the project includes administration and construction financing. The average

residential user rates are currently \$6.80 per month for sewer and \$23.20 per month for water. Rates are projected to increase to \$17.21 per month for sewer as a result of this project. The combined average residential water and sewer rate will be \$40.41 per month. The current DOC target rate, based upon the (1990) median household income of \$19,732 per year, is \$32.56 per month.

The budget includes \$23,000 for an administrative consultant, \$17,000 for preliminary engineering, \$93,163 for engineering and construction oversight, and \$59,208 (10%) for contingency. These figures are reasonable for a project of this scope.

Benefit Assessment:

Renovations and expansion of the sewer treatment system will remedy discharge effluent quality problems and improve operational capabilities. Installation of a system meter will allow the operators to document system flows, but will not encourage water conservation among users.

The system is currently operational (with permit violations). The project will directly benefit 297 current users through management of the system to extend the useful life of the system. Benefits are immediate and long-term. The projected design population (20-year) is 361.

Environmental Evaluation:

This project will result in typical construction related short-term adverse environmental impacts, which cannot be entirely avoided in any construction project. Construction impacts must be identified and mitigated to the extent possible. Mitigation efforts may include dust abatement procedures, traffic control procedures, and load restrictions on public streets. Mitigation efforts will be required to prevent silt from entering Flat Creek as a result of construction activities. No long-term effects are anticipated.

Funding Recommendation:

DNRC recommends grant funding in the amount of \$50,000. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws and shall ensure the project is designed in accordance with DEQ requirements

Project No. 34

Applicant Name: Roosevelt County Conservation District

Project Name: Fort Peck Assiniboine and Sioux Rural Water Supply Project

Amount Requested: \$ 82,109 Grant

Other Funding Sources: \$ 160,000 Congressional Appropriations

Estimated Total Project Cost: \$ 242,109

Amount Recommended: \$ 82,109 Grant

Project Abstract: (Prepared and submitted by applicant.)

Roosevelt County Conservation District is requesting funds to complete an environmental assessment that is necessary to meet NEPA and MEPA requirements for a regional community, rural, and industrial water project to be interconnected with the Fort Peck Assiniboine and Sioux Rural Water Project. Construction funds for the on-reservation portion of this project are proposed for authorization by the U.S. Congress (S. 841) and which, as proposed, will provide for the enlargement of the intake, treatment plant, pipelines, pumping stations, and related facilities to deliver water off the Fort Peck Indian Reservation to surrounding communities, rural residences, and pasture taps for livestock. As proposed, the authorizing legislation will provide for 75 % of the off-reservation planning, design, and construction funding and the funding for enlargement of facilities on the reservation from Congressional appropriations, and 25 % from local (Montana and water user) funds.

Environmental assessment of the Fort Peck Assiniboine and Sioux Municipal and Rural Water Supply System is underway using federal funds within the Fort Peck Indian Reservation only. The off-reservation environmental assessment would be funded, at least in part, from the project proposed here. This project will supplement federal funds anticipated for off-reservation environmental assessment in fiscal year 1998. Those federal funds are not confirmed at this time.

The planning of this project has been previously funded by the Montana Renewable Resources Program for needs assessment and feasibility investigation. The grant funds demonstrate the commitment of the State of Montana to assist in the planning stages of the project until such time as sufficient information is available at both the state and federal level to permit formal State of Montana support for the project. The United States has provided considerable funding (\$800,000) for the planning effort.

Technical Assessment:

Project Background:

The proposed project consists of conducting an environmental assessment (EA), as required by NEPA and MEPA, for a large regional water distribution system adjacent to the Fort Peck Assiniboine and Sioux Reservation. The water system would be incorporated with a regional supply, treatment, and distribution system being proposed for the reservation. The EA for the Fort Peck Assiniboine and Sioux Municipal and Rural Water Supply System is currently underway (the on-reservation portion of the project), and is being funded with federal money.

Technical Approach:

The goal of this project is to conduct an EA as required by NEPA and MEPA. The EA process will identify the most environmentally beneficial alternatives to the design and construction of a regional water distribution system that will service a four-county area in northeastern Montana. The distribution system will be tied to a regional supply, treatment, and distribution system being proposed for the Fort Peck Assiniboine and Sioux Reservation.

If funding is acquired as planned, the applicant will contract with a consultant to conduct the EA and prepare a report. The applicant will administer the project and will contribute 0.25FTE for two employees for a period of one year.

A needs assessment has been previously conducted for the off-reservation portion of the project. Indications are that the project has public support and will be affordable if the federal government agrees to provide 75% of the construction funding required.

Project Management:

The Roosevelt County Conservation District will administer the project. The district administrator and an additional staff member will each contribute 25% of their time to the project for a period of one year. The application is unclear as to the mechanism that will be employed to coordinate all of the agencies that will be involved in the EA process.

A consultant will conduct fieldwork for the project. Study requirements necessary to satisfy the NEPA process will be coordinated closely with the USBR since it is the lead federal agency on the project. Input will be solicited from the public through public meetings. Input from the appropriate state and federal agencies will be solicited throughout project development.

Financial Assessment:

RRGL Grant Costs

Administration	\$ 22,280
Consultant	59,829
Total Grant Costs	\$ 82,109

Estimated Total Project Costs \$ 242,109 RRGL Grant Share = 34%

The unit costs associated with the consultant for the proposed study are reasonable and adequate. No equipment purchases are proposed. The administrative costs are not excessive.

Proposed funding for the project includes \$160,000 in federal appropriations. The spending bill for the appropriation was passed in the final days of congress, with \$200,000 for use to complete the EA on the reservation and \$160,000 to complete the EA for the off reservation communities. It is not clear what the total budget for this study will be. The actual cost of completing the EA is unknown at this time.

Benefit Assessment:

This project will provide information necessary to select alternatives that will best serve the public and protect and conserve natural resources and the environment. Additionally, the project will directly support the development of a regional water system that includes state, tribal, and federal (USBR) participants.

Citizen benefits will be derived from actual construction of the regional water system. According to the application, the off-reservation system will provide water to approximately 8,000 persons in a four-county area. Agriculture will benefit in that the project would provide water sufficient for 50,000 head of livestock on 600 farms and ranches operating on 2 million acres.

The benefits of a regional water system are quantifiable if one considers economic development potential, increased agricultural production potential, and the elimination of current water acquisition and treatment costs for individuals and local entities.

Environmental Evaluation:

The study will determine the environmental impacts of the proposed off-reservation water distribution system. Conducting the EA will not have adverse environmental impacts of significance. There may be some core drilling associated with geo-technical or geologic investigation, off-road travel, etc. that may be of minor significance.

Funding Recommendation:

DNRC recommends grant funding in the amount of \$82,109. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws and shall ensure the project is designed in accordance with DEQ requirements.

Project No. 35

Applicant Name: Town of Brockton

Project Name: Water & Wastewater Systems Improvements

Amount Requested: \$ 100,000 Grant

Other Funding Sources:	\$ 400,000	CDBG Grant
	100,000	EPA Grant
	180,000	Indian Health Service Grant
	6,750	Local Funding
	18,500	Tribe Labor
	161,250	Rural Development Grant
	53,750	Rural Development Loan

Estimated Total Project Cost: \$1,020,250

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

History - Two main problems face the town. 1) The state has issued several recent health advisories and boil orders; and 2) one- to two-thirds of the lagoon system is being bypassed and there have been spills into the Missouri.

Problem - The following are basic problems to be solved by the project:

- Deteriorated and unsealed steel tanks (probable source of fecal contamination).
- Unsealed abandoned wells near source wells.
- Dead-end pipelines.
- Deteriorated clay sewer lines.
- First one or two of three-cell series lagoons being bypassed due to poor hydraulics.
- Obsolete hydrants, lack of isolation valves (entire system shut down 36 hours last year during repairs), undersized lines feeding hydrants.

- System unmetered.
- No controls to coordinate tank elevation to well activation (now manually observed, actuated).

There is obvious evidence of birds using the tank as a perch, and their wastes have probably washed into the tank. Lack of meters creates unnecessary hydraulic loading on the lagoons.

Proposed Solution - The proposed project will provide a new 150,000-gallon water storage tank (buried concrete) and seal open wells for control of bacteria sources; replace many hydrants and provide isolation valve; replace pipes most in need due to under-sizing; and provide additional looping for increased fire protection and to avoid build-up of bacteria and rust in dead ends. Water meters will be installed to provide conserve water and allow growth, and controls will be installed for automatic operation of wells and avoidance of overflows from tank.

Some clay-tile sewer pipe will be replaced. A new highway crossing will add hydraulic head to the lagoons to allow wastewater to receive full treatment. Meters will limit hydraulic loading and allow growth.

Technical Assessment:

Project Background:

The proposed project consists of improvements to the public water and sewer systems of the town of Brockton.

The town water system is supplied by three groundwater wells, which are connected to a well house by a manifold. Two 50,000-gallon steel water storage tanks provide water storage. Proposed water system improvements will address source protection (sealing abandoned wells near source wells), water storage system, and water distribution system needs.

The town sewer system consists of gravity collection mains and a lagoon system. Proposed sewer system improvements will address collection system needs, which are needed to eliminate leaking collection mains and improve lagoon system hydraulics and treatment efficiency.

Technical Approach:

The goals of this project are to protect the groundwater supply by sealing abandoned wells. Deteriorated sewer mains will be and water conserved through implementation of a water-metering program. Improvements to the water storage and distribution system will provide safe drinking water, and wastewater treatment will become more efficient through improved hydraulic efficiency of the treatment lagoons.

The existing water supply, storage, and distribution system is in operable condition. Water supply and distribution system needs were identified in the engineering report. Recommendations in the report include: sealing abandoned wells near source wells to protect groundwater quality from surface contamination sources; installation of automated controls to operate water wells automatically based on storage tank levels; installation of water meters to encourage water conservation; construction of a new 150,000-gallon water storage tank; installation of new water mains to loop dead end lines to improve fire flow capabilities; and replacement of inoperable fire hydrants and water main valves.

Project Management:

The project management team proposed for this project consists of the mayor, town council, clerk/treasurer, town attorney, an administrative consultant who is responsible for administration of the various grants and loans, and the engineer. The administrative consultant will be responsible for most grant and loan administration tasks.

Town officials and their consultants are familiar with public bidding and procurement statutes and will advertise and bid this project accordingly. Wage and labor standards will be strictly enforced.

Town officials have demonstrated their commitment to planning improvements for community needs through completion of the 1998 Preliminary Engineering Analysis for Water and Sewer Improvements.

Financial Assessment:

RRGL Grant Costs

Water System Construction	\$ 70,000
Wastewater System Construction	20,000
Contingency	10,000
Total Grant Costs	\$ 100,000

Estimated Total Project Costs \$ 1,020,250 RRGL Grant Share = 9.8%

The estimated cost of the project includes administration, contingency, and interim financing. The average residential user rates are currently \$12.50 per month for water and \$2.50 per month for sewer. Rates are projected to increase to \$15.50 per month for water and \$8.50 per month for sewer as a result of this project. The proposed combined average residential water and sewer rates will be \$24.00 per month. The current DOC target rate, based upon the median (1990) household income of \$13,375 per year, is \$22.07 per month.

The budget includes \$36,643 for an administrative consultant, \$56,750 for engineering, \$49,000 for construction oversight, and \$74,100 (10%) for contingency. These figures are reasonable for a project of this scope.

Benefit Assessment:

Sealing abandoned wells near the town's source wells and replacing the old storage tanks with a new 150,000-gallon tank will allow the town to continue to provide safe water to users. Water distribution improvements will provide water quantities required to meet recommended fire flows for the community.

Installation of service meters will encourage water conservation among users.

Renovations to the sewer collection system will remedy existing operational problems. The collection main feeding the lagoon and other lines clog due to the flat pipe grades. Completion of proposed improvements will reduce collection system operation and maintenance costs and improve lagoon hydraulics.

The project will directly benefit 491 current users. These benefits are immediate and long-term.

The projected design population (20-year) is 614.

Environmental Evaluation:

This project will result in typical construction related short-term adverse environmental impacts, which cannot be entirely avoided in any construction project. Construction impacts must be identified and mitigated to the extent possible. Mitigation efforts may include dust abatement procedures, traffic control procedures, dewatering system discharge plans, and load restrictions on public streets. Mitigation efforts will be required to prevent silt from entering Cut Bank Creek as a result of construction activities. Water use restrictions may be necessary during renovation of the existing water storage tank and standpipe.

No long-term adverse effects are anticipated.

Funding Recommendation:

DNRC recommends grant funding in the amount of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws and shall ensure the project is designed in accordance with DEQ requirements.

Project No. 36

Applicant Name: Town of Neihart

Project Name: Water Distribution Improvements

Amount Requested: \$ 97,770 **Grant**

Other Funding Sources: \$ 3,950 Town of Neihart

Estimated Total Project Cost: \$101,720

Amount Recommended: \$76,770

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - Neihart's original water distribution system was constructed 1892. The system primarily consisted of a reservoir on O'Brien Creek and a shallow (2 to 4 feet deep) 12-inch main running down O'Brien creek to Highway 89 and then along Highway 89 through the Town of Neihart. Over time, various distribution laterals and water services were connected to the main, with many laterals and services later being abandoned.

Neihart has been under almost continuous boil order since 1980. The boil order was lifted during the fall of 1997 due to construction of a new water treatment plant and replacement of much of the water distribution system. However, the boil order had to be reinstated at the end of December 1997 and continued in place through out the winter and early spring. The reason for reinstating the boil order was the treatment plant did not have enough capacity to keep up with consumption, and untreated water had to be added to the system.

Problem - Neihart's current water problems stem from usage during the coldest part of winter exceeding the capacity of the treatment plant. Many of the water users need to waste water through open taps or other means to prevent their service lines from freezing. In many cases, service lines from the mains to the residence were not buried any deeper than the level of their connection to the main.

Proposed Solution - There are several possible solutions to this problem. The first is to provide water meters for all users, which, with a progressively higher water rate for excess consumption, should encourage conservation. The second solution is to bury service lines that are shallow so users will not have to run water to prevent freezing. Third, the town should continue to make water customers aware of the system's problems and educate them about solutions to wasting water.

Technical Assessment:

Project Background:

In 1996, the Town of Neihart installed a new surface water treatment plant on O'Brien Creek, its sole water source, using largely public grant and loan funds. Due to severe budget constraints, only one treatment train was installed at the plant and it is about 30 gpm under capacity. There is a water shortage during the winter months when many local water users waste water through open taps to prevent freezing of their service lines and plumbing. Whenever a water shortage occurs, surface water bypasses the treatment plant and enters the public water system to meet demand. This situation necessitates a boil order to protect the water users from waterborne diseases potentially carried by the untreated water.

Technical Approach:

The goal of this project is to keep the towns water usage from exceeding the water treatment plant capacity, particularly during the winter months. Three possible solution alternatives for meeting this goal were considered in the Neihart water system facility plan: (1) repairing water system leaks; (2) increasing water treatment plant capacity; and (3) limiting water usage by preventing service-line freezing, educating the public about water conservation, and metering. The community chose the third alternative because it could be totally funded with a DNRC grant. Although a detailed present-worth analysis was not presented for the alternatives, the general cost figures and the known benefits of water conservation support the selection of metering as the best solution option. Although the project scope includes lowering of 30 service lines in addition to installing meters for all 86 water users, this item should be removed from the scope of work considered for DNRC funding. Most communities require individual homeowners and businesses to be responsible for their own water service lines, and it seems appropriate to apply this policy in Neihart.

Project Management:

The Town of Neihart has appointed a project manager who will complete most of the administrative requirements of the project, coordinate with the engineering firm, and monitor the project. The water service line improvements will be designed by an engineering firm, which will also be responsible for the bidding process and project inspection. During actual construction, the project engineer will be in daily contact with the project manager. The town clerk/treasurer will handle all project accounting and payment of project expenses. Interaction with other governmental agencies will be minimal due to the nature of the project.

No public input was documented in the application and since water system metering is not always

openly accepted by a community, some public discussion should have already occurred on the topic. The application did not address future public involvement in the project or how metering would be implemented with any objecting homeowners. The fact that only 24 Neihart homes are year-round residences complicates the billing rate structure if equity among users is to be ensured. This issue, as well as whether grant funds should be used to lower 30 individual service lines, should already have been discussed to some degree.

Financial Assessment:

RRGL Grant Costs

Final Engineering Design	\$ 4,500
Construction Inspection	2,500
Construction	81,700
Contingency	9,070
Total Grant Costs	\$ 97,770

Estimated Total Project Costs \$101,720 RRGL Grant Share 96%

The Town of Neihart has to seek grant funding because it has reached its borrowing limit and does not have adequate reserves. Since the project will be completed almost solely with grant funds (in conjunction with some local funding), the Town of Neihart is not proposing a rate increase for the 86 current water system users at this time. However, additional water operation and maintenance costs are expected as a result of metering to cover the costs of meter reading, maintenance, and billing and may necessitate a rate increase in the future.

Meter and service line installation costs appear to be slightly low, although the project engineer has indicated that these costs are based on construction in the rocky soils prevalent in Neihart. The number of homes served by the project may need to be reduced if many meter installations prove to be very difficult.

Since it is questionable as to whether the cost of lowering water-service lines at 30 individual homes should be funded by the DNRC, it is recommended that the total project construction cost be reduced by \$21,000 (the cost of water-service-line lowering). No adjustment to the amount of contingency should be made since the variability of metering costs, which are also possibly underestimated for this project, justify the use of a higher contingency rate.

Benefit Assessment:

This proposed metering project would benefit the Town of Neihart by conserving the public water supply and improving water-use efficiency. Currently water is wasted through open taps during the winter months to prevent water-service lines and plumbing from freezing. The installation of meters should not only eliminate this practice, but also reduce the amount of water usage throughout the year to below the treatment plant's capacity. The 86 homes and businesses on the public water system in Neihart will greatly benefit from this project since it should no longer be necessary to supplement the treated water supply with untreated water bypassed around the plant. This would greatly reduce the risk of waterborne disease to the water users and eliminate the need for boil orders. With a reduction in the amount of water taken from O'Brien Creek for Neihart's public water supply, instream flows for other uses will be increased.

Environmental Evaluation:

Since this project consists solely of improvements to existing water service lines, no negative environmental impacts should result. The meter pit installations and lowering of water service lines will occur within previously disturbed private property. There may be some minor dust and noise problems during construction, but they will be of short duration at each individual home or business.

Funding Recommendation:

DNRC recommends grant funding in the amount of \$76,770 to cover the installation of meters for all 86 Neihart public water users. Grant funds for the project will be provided after the DNRC approves a scope of work, administration, and a budget, and after the Town of Neihart passes a resolution requiring water metering for all its water users. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

Project No. 37

Applicant Name: Lewis and Clark County Water Quality Protection District

Project Name: Helena Area Groundwater Quality Monitoring Network

Amount Requested: \$100,000 Grant

Other Funding Sources: \$ 13,692 Project Sponsor
 12,081 Montana Bureau of Mines and Geology

Estimated Total Project Cost: \$125,773

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

The Helena area is one of the fastest growing localities in the state of Montana. Lewis and Clark County has the sixth largest population in the state, with a 12.1 % growth rate since April 1, 1990. Expansion of residential and industrial development into both the Helena Valley alluvial aquifer as well as hydrologically sensitive bedrock areas is occurring rapidly, increasing pressure on limited water supplies and exposing the aquifers to an ever-increasing number of contaminant sources.

Over 55 % of Helena area citizens obtain their drinking water from local groundwater aquifers. Several studies, including two USGS reports, state that water quality in the Helena area alluvial aquifer is showing signs of degradation in areas having high densities of septic systems, sewage lagoons, and older cemeteries. Other sampling in the area has shown elevated heavy metals concentrations as well as hydrocarbon contamination from sources including leaking underground storage tanks, old landfills, improper disposal of used waste oil, and industrial activities.

A major conclusion and recommendation in a recent report, entitled "Helena Area Wastewater Treatment Facilities Plan," is to establish a groundwater monitoring network to define the potential groundwater impact of current wastewater management practices in the Helena Valley. The proposed project will enable the Lewis and Clark County Water Quality Protection District to collect and maintain comprehensive, scientific baseline data. This information will provide citizens,

planners, commissioners, and other decision makers the information they need to form policies and make appropriate land-use management decisions for responsible growth in the Helena area. Through continued water level measurements and water quality sampling from appropriately sited and properly constructed monitoring wells, the district can continue to monitor the local groundwater aquifers for the protection of public health and economic well being of Helena-area citizens.

Technical Assessment:

Project Background:

The proposed study is located in southeastern Lewis and Clark County. The proposed study will evaluate the upper water bearing units of the Helena area that are primary source of domestic drinking water outside of the Helena city limits. The upper water bearing units generally consist of the basin-fill aquifer of the Helena Valley and the surrounding bedrock aquifer systems. Both individual homes and subdivisions tap the upper water bearing units within the Lewis and Clark Water Quality Protection District. Past efforts in the study area have primarily focused on studying the shallow basin fill aquifer. Domestic water wells, municipal water wells, and monitoring wells were installed to study the groundwater system. Currently, there is also a USGS bedrock groundwater study underway, which will provide important hydrogeologic information for the bedrock aquifer systems in the Helena area.

The proposed project expands past efforts for the basin-fill and bedrock aquifers in the Helena area. Permanent monitoring wells are proposed to replace domestic and aging monitoring wells the district currently uses for water quality and water level monitoring. Information from the proposed study will be used by the district to make recommendations to the county that are needed to manage and protect groundwater resources.

Technical Approach:

The Lewis and Clark Water Quality Protection District seeks funds to collect data and to manage and protect groundwater resources. Primarily, the proposed project will install a permanent and dedicated monitoring well network in the Helena area. Installation of monitoring wells is proposed to replace domestic wells and existing monitoring wells in disrepair. The proposed project will be completed by reviewing geologic and hydrogeologic literature for the area, selecting locations to drill new monitoring wells, designing the monitoring wells for specific data collection needs (i.e., deep vs. shallow groundwater), drilling and installing 30 new monitoring wells, collecting an initial set of water quality samples from the wells, and preparing a final report. Once the monitoring wells are completed, the district will use the wells for long-term monitoring. The applicant did not locate the proposed monitoring wells on a map as part of the proposal, and reserved this effort for the funded project.

The district and MBMG will perform the technical activities under this proposal. These activities will include installation of 30 monitoring wells, logging lithologic conditions, measuring water levels in wells, collecting water quality samples, and interpreting the results. Water quality samples will be collected from the new monitoring wells and ten additional sites, for a total of 40 sites monitored by the district. The samples will be analyzed at an offsite laboratory for common ion water chemistry. Trends in water levels and flow direction will also be monitored.

Based on the RRGL application and supplemental technical information provided by the district, there are additional technical recommendations for the project. Communication with USGS is essential in order to minimize the project costs and link data collection efforts currently underway

at USGS. This should include sharing data collected by USGS for the bedrock study (currently underway), which may minimize the need for the district to evaluate bedrock conditions. A better description of the long-term monitoring plan after the RRGL effort is completed should have been included in the technical narrative. The project should be focused on one major aquifer, such as the Helena Valley basin-fill aquifer, and only the surrounding margin of the bedrock aquifer(s) included in the effort.

Project Management:

The project would be managed by the Lewis and Clark Water Quality Protection District. The district will guide the project, ensure the data collection and reporting efforts are relevant to managing the groundwater resources, communicate and address public concerns, and administer the RRGL grant. MBMG will provide technical support for this project. Project implementation is estimated to last approximately 1.5 years.

Financial Assessment:

RRGL Grant Costs

Administration	\$ 6,015
Professional	11,219
Construction	64,333
Travel	700
Laboratory	11,300
Equipment, misc.	6,433
Total Grant Costs	\$ 100,000

Estimated Total Project Costs \$ 125,773 RRGL Grant Share = 80%

In general, the costs outlined in the grant application are consistent with costs typical of setting up a monitoring network in western Montana and analyzing water quality samples for common in water chemistry. A drilling rate of \$35 per foot for drilling, and estimates for all materials, construction, and development are conservative, and adequate for monitoring well installation in the Helena area. The total number of monitoring wells proposed by the district, and the overall project cost, may be excessive considering that USGS has already installed 23 monitoring wells in the Helena Valley. Depending upon access, construction, and location of these monitoring wells, the overall project budget could be reduced proportionately by replacing the proposed monitoring wells with USGS monitoring wells (or other monitoring wells) that are already installed.

A total of \$1,600 of the professional fees would go to local contractor to sample 40 well sites, which is reasonable considering the rate charged is \$40 per hour. In general, all professional fees are reasonable and adequate for the proposed effort.

Project funding is in place with firm commitments from all funding sources. However, one reviewer had concerns for funding after the RRGL effort is completed (i.e., the monitoring wells are installed). A stronger commitment of funding from the district is needed to ensure the new monitoring wells are sampled in the future, and would not stand idle.

Benefit Assessment:

The project will collect scientific data that are needed by the District, and Lewis & Clark County, to manage groundwater resources in the Helena area. In addition, this project will establish a permanent monitoring well network for water quality monitoring. This particular element is important because it sets an example for other Montana communities to follow suit, and take a proactive management approach for protecting groundwater resources. The proposed project expands the current water quality and water availability evaluation efforts conducted by the district by establishing a permanent monitoring well network, which would replace domestic wells currently monitored. The project supports the county's ongoing groundwater resource management program. Primarily, this project will help manage and protect groundwater resources for over 27,000 residents in the study area that use groundwater as their drinking water source, along with several agricultural operations that use groundwater for irrigation.

Environmental Evaluation:

No significant adverse environmental impacts will occur as a result of activities associated with the project.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The Lewis & Clark Water Quality Protection District shall attempt to coordinate monitoring activities with similar efforts currently underway at USGS. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 38

Applicant Name: Town of Eureka

Project Name: Wastewater System Improvements

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 300,000 CDBG Grant
 300,000 TSEP Grant
 652,250 SRF Loan
 27,750 Local Funding

Estimated Total Project Cost: \$1,380,000

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Catastrophic failure of the effluent storage pond dike at Eureka's wastewater treatment plant in 1995 resulted in thousands of dollars in damage and direct discharge to the Tobacco River-Lake Koocanusa system. DEQ subsequently issued a "Notice of Violation - Request for Compliance," mandating the town to identify all wastewater facility concerns through a facility plan study and to implement improvement plans.

A new land application site needs to be developed because the size of the existing facility is marginal and an adversarial relationship has developed between the town and the site owner. Currently, the town is having to operate the land application facility under court order to overcome the site owner's objections. The town's lease on the property expires in 2001, and will not be renewed without condemnation.

Groundwater is infiltrating areas of the collection system, which reduces treatment efficiency and threatens to overtax the winter storage pond capacity. The last area of town not on the wastewater collection system lies directly up gradient from the town's water supply. Lastly, Eureka's reserve and capital improvement funds have been exhausted in having to repair the dike failure; thus financial assistance is urgently needed to meet these pressing wastewater needs.

The approved facility plan study recommends a project to develop a new land application system, replace specific portions of the collection system subject to groundwater infiltration, replace the aeration system, and provide centralized wastewater collection to the Riverside Drive area.

The project will benefit all the residents of Eureka through providing improved and reliable wastewater facilities. Conservation of resources is achieved by totally reusing treated wastewater for crop production, reducing groundwater loss into the collection system and related energy costs, and reusing nutrients present in the wastewater effluent. The project protects and preserves the instream quality of the Tobacco River-Lake Koocanusa system and associated beneficial and recreational uses by avoiding effluent discharge. Groundwater quality is enhanced by reducing sewer exfiltration, improving treatment and land application processes, and replacing septic tanks near the town's water supply with centralized sewer collection facilities.

Technical Assessment:

Project Background:

There have been no major improvements to the Eureka's sewage collection system since its initial construction between 1920 and 1950. The most recently completed wastewater project for the town was the repair of the lagoon dike, which catastrophically failed in 1995. Since that time, DEQ has worked closely with the Town of Eureka to complete the wastewater facilities planning study necessary to successfully identify and implement the necessary improvements. Another major impetus for the proposed project is the adversarial relationship that has developed between the town and the owner of the wastewater land application site. Since the town's land lease expires in the year 2001 with no hope of renewal, the Town of Eureka is desperately in need of a new land application site.

Technical Approach:

The goals of this project are to solve the current problems associated with land application, to reduce the amount of inflow and infiltration (I/I) entering the collection system, to service unsewered areas of Eureka with the public sewer system, and to improve the existing wastewater treatment pond. The Town of Eureka's wastewater facilities planning study grouped solution alternatives into the categories of (1) wastewater collection system, (2) wastewater treatment and (3) effluent disposal and considered a variety of factors to derive a final best solution plan. The selected alternative includes replacement of three sections of sewer main and a lift station, development of a new land application site, servicing the Riverside and Historical Village areas with the public sewer system, and replacement of the lagoon's aeration system.

The sewer main replacements are predicted to reduce the amount of I/I by 30 % and this assumption was used in determining the adequacy of the existing lagoon capacity. Although the I/I problem appears to have been well analyzed, the effect of these particular main replacements on I/I reduction can not be ascertained until actual flow measurements are taken after construction. If the desired amount of I/I reduction is not achieved, the lagoon capacity would be inadequate to handle the additional load from the Historical Village and Riverside areas if they were sewered. It would therefore seem wise to delay the sewerage of these areas until the success of I/I reduction is determined.

Possible problems may exist with land acquisition since a new land application area has not yet been specifically chosen. However, these issues should not be insurmountable and might simply require some careful negotiation.

Project Management:

The Town of Eureka has already retained the project manager and project engineer who will be responsible for overall project implementation and all engineering responsibilities for the wastewater facilities improvements. The town's attorney will provide the required legal guidance, and the town clerk/treasurer will help administrate and manage the project. The mayor will have ultimate responsibility for the management of activities and the expenditure of funds. Because the project manager/engineer has established a good working relationship with the Town of Eureka on past projects, it is expected that the project team can successfully implement this project.

Financial Assessment:

RRGL Grant Costs

Administration	\$7,500
Final Engineering Design	8,000
Construction Inspection	4,000
Construction	76,500
Contingency	4,000
Total Grant Costs	\$100,000

Estimated Total Project Costs \$1,380,000 RRGL Grant Share = 7%

Construction costs are taken from the detailed cost estimates provided in the final wastewater facilities planning study document for the Town of Eureka that was approved by DEQ in April 1998. The professional services (for project administrator), audit, and legal costs seem high, but given the \$1,380,000 total cost of this project, an overestimate of these amounts does not seem significant. Five thousand dollars were included in the land acquisition cost to cover the legal fees for land purchase, which would bring the total estimated legal fees to \$15,000. The Town of Eureka will donate in-house personnel services and office space necessary to help administer and manage the project. However, with \$45,000 allocated for a contracted project manager, it is not expected that town personnel will need to work many hours on the project. Given the varied nature of the project (from sewer main and lift station replacement to land acquisition and lagoon aeration system replacement), a 10 % contingency would seem more reasonable than the 5 % designated in the budget.

Grant applications have been made to the CDBG program and TSEP. The Town of Eureka has discussed an SRF loan with DEQ and was told that there was a high probability that this project could be funded.

Currently the citizens of Eureka pay \$15.08 monthly for their sewer service. The proposed wastewater improvement project will increase the monthly operation and maintenance costs and reserve costs by \$0.97 (per hookup) and increase the monthly debt service by \$9.62 (per hookup). This will result in a new monthly sewer service charge of \$25.67 per customer. The combined fees for sewer and water will amount to \$40.25. This amount exceeds the target value of \$34.79 by 16%.

Benefit Assessment:

The Eureka wastewater facilities improvement project will provide significant benefits to Montana's renewable resources and Montana residents. With the replacement of leaky sewer mains, the amount of clean groundwater infiltrating the collection system is expected to be greatly minimized. In addition, the groundwater will be protected from contamination by exfiltrating wastewater. Reduction of I/I in the collection system will save energy through reduced wastewater flow at the pump stations. The addition of efficient aeration equipment at the lagoon will improve the quality of the effluent released for spray irrigation.

Environmental Evaluation:

No long-term negative impacts were noted in the environmental assessment for the proposed Town of Eureka wastewater facilities improvements project. Long-term positive environmental impacts include a reduction in groundwater contamination from leaking sewer mains and a decrease in energy needs for wastewater pumping because of a reduction in the amount of I/I. Dust and noise will cause negative environmental problems during construction, but they are unavoidable and temporary in nature. Mitigation measures during construction can help to minimize the level of dust in the air.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000, based on the elimination of sewerizing the Historical Village and Riverside areas from the project's scope. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project. The project shall be designed and constructed in strict accordance with EPA and DEQ requirements.

Project No. 39

Applicant Name: Town of Ekalaka
Project Name: Ekalaka Water Source Improvement

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 6,000 Rural Development Grant
 5,000 Town of Ekalaka (In-kind)
 4,000 Town of Ekalaka (Reserve)

Estimated Total Project Cost: \$ 115,000

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - The Ekalaka water system was originally constructed in the mid 1930s. Two major improvement projects were undertaken in 1986 and 1994. Refer to the preliminary engineering analysis for further information on this system and those projects. Being 35 miles from the next town and providing water for many of the residents of Carter County, the Ekalaka water system is a critical local resource.

Problem - The existing problem with this water system is its source. This application focuses only on this situation. All wells are either in poor condition or being threatened by contamination. This situation is such that the town must proceed with the renovation or replacement of its source wells in the near future in order to prevent an emergency situation. The problems with each well are discussed in more detail in the preliminary engineering analysis.

Proposed Solution - The solution most technically and economically feasible is to renovate wells 4 and 6. Treatment will be provided to eliminate the hydrogen sulfide problem in Well 4, while Well 6 will be deepened to increase the yield and the well will be rescreened and redeveloped. Again, a detailed discussion of the proposed solution and why this was the selected alternative is presented in the preliminary engineering analysis.

The proposed solution will conserve and protect this valuable natural renewable resource in Carter County and provide a significant public benefit to the majority of the residents of the county. It will also produce a positive environmental impact. This solution also has strong local support.

Technical Assessment:

Project Background:

The proposed project consists of improvements to the Ekalaka water supply. These improvements will address specific deficiencies in the system that affect public health and safety.

The Town of Ekalaka currently uses five wells as a source of water supply. Well 3 has produced most of the water supply for Ekalaka in recent years. This has been a reliable well and produces high quality water. This well is now faced with a serious threat. A significant fuel oil contamination site exists near this well. This contamination is being monitored by the DEQ, which has indicated that the plume is at or very close to the well. DEQ has also identified that the plume extends to a

depth of 50 feet, thus making clean up almost impossible.

Other wells in the system have problems and therefore are primarily used only during periods of peak demands. Problems include poor water quality, low quantity or pumping sand, and the presence of hydrogen sulfide gas. This project will rehabilitate two of the existing wells for use as the primary drinking water source should Well 3 become contaminated. The renovation of these two wells will provide a valuable backup and supplemental water source to Well 3 water and will serve as the primary water supply between the likely time of contamination and the replacement of Well 3 through the Petroleum Tank Release Compensation Board.

Technical Approach:

The goals of this project are to provide the Ekalaka with a supplemental water supply. This would provide the town with water should Ekalaka's existing water supply well become contaminated by an existing fuel oil plume. The objectives will be achieved by the proposed project.

Wells 4 and 6 will be rehabilitated so that these wells will produce enough high quality water to meet the town's current needs. Well 4 produces a sufficient quantity of water but contains hydrogen sulfide gas. Hydrogen sulfide is both a nuisance and a health concern. This gas produces both a taste and odor in the water, making the water objectionable for domestic use. The town proposes to treat water from Well 4 using an existing chlorination system. Some equipment will be replaced to allow for a higher chlorine feed rate.

Well 6 has problems both with producing adequate water quantities and poor quality. The proposed rehabilitation for Well 6 consists of removing the existing well screen and deepening the well into another formation known for producing high quality and larger quantities of water. A geophysical log will be produced and test pumped to show that the well is actually capable of producing the required amounts of water.

Concerns have been raised about the need for additional treatment after the water has been chlorinated for sulfide removal. When chlorine is added, regardless of the amount, to sulfur-bearing water, colloidal free sulfur will be formed if enough chlorine is added to more than satisfy the natural chlorine demand of the water. The formation of free sulfur is readily evident as a milky-blue turbidity. The preliminary engineering report submitted by the applicant did not address this issue. Also, other alternatives for removal of the hydrogen sulfide gas, such as the addition of potassium permanganate, were not considered.

It is also proposed to add Well 4 to the telemetry system. This will allow town personnel to more effectively operate and monitor the water system.

Project Management:

Project management will be conducted by the town clerk/treasurer. All work will be conducted at the town office using the town's other resources to support this effort. The clerk has adequate experience and qualifications to manage this project. This experience includes previously working with DNRC and Rural Development programs.

The town will select a consulting engineer to design, bid and provide construction oversight for this project according to DNRC selection criteria.

Financial Assessment:

RRGL Grant Costs

Engineering	\$ 8,500
Construction Inspection	10,500
Construction	74,000
Contingency	7,000
Total Grant Costs	\$ 100,000

Estimated Total Project Costs \$ 115,000 RRGL Grant Share = 87%

The estimated cost for this project, including administration and a contingency is \$115,000. The town also has secured a \$6,000 grant from Rural Development and will be providing \$9,000 (In-kind and from reserve). The total budget is complete and reasonable.

The Town of Ekalaka has shown a considerable financial commitment to its water system over the years. Considerable debt remains from projects undertaken in 1986 and 1994. The town also funded the \$8,875 for the preliminary engineering effort prepared for this application. The average monthly residential rate is \$30, which is approximately \$5 more than the target rate of \$25.07. Current water rates, system debt, system reserves, operation and maintenance costs, and other past and present financial commitments of the town to its water system make further debt accumulation prohibitive.

Benefit Assessment:

This project will provide the Town of Ekalaka with a supplemental water supply should an existing fuel oil plume contaminate the existing water supply well. This supplemental water source will reduce usage of the well, thus potentially slowing the movement of the contamination plume. Should Well 3 become contaminated, it can be immediately and properly plugged and relocated, helping to ensure the long-term production of the aquifer.

Rehabilitation of wells 4 and 6 will provide the residents of Ekalaka and the surrounding community with a higher quality and more reliable water supply. The water system provides potable water to over 1,000 people in Ekalaka and Carter County and to approximately 17,000 head of livestock.

The looming contamination of the town's water supply well presents a potential health and safety problem to the public. Supplementing Well 3 with water from rehabilitated wells will reduce this health and safety risk. Taking action now will allow a source of high quality water to be in place when Well 3 becomes unsuitable for drinking. If this problem is not addressed and Well 3 is contaminated, the town would be forced to use water from wells with low water quality and water that contains hydrogen sulfide gas.

Environmental Evaluation:

This project will produce some short-term adverse environmental impacts that are normally associated with construction activities. Impacts include dust, water quality impacts and erosion control, noise, loss of vegetation, encroachment of noxious weeds, etc. Most of these short-term adverse impacts can be minimized with commonly used mitigation measures.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 40

Applicant Name: Garfield County Conservation District
Project Name: Rehabilitation of Little Dry Creek Diversion Dam and Outlet Works

Amount Requested: \$100,000 Grant

Other Funding Sources: \$ 9,500 Little Dry Water Users Association
 1,000 Garfield County Conservation District

Estimated Total Project Cost: \$110,500

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

This project involves the rehabilitation of an existing irrigation diversion structure and outlet pipe on Little Dry Creek in southeastern Garfield County. This structure is needed to divert the spring/early summer runoff from the area to a canal system for use by the Little Dry Water Users Association. The original design is a composite concrete and timber plank structure with a 48-inch gated pipe outlet. The 48-inch pipe discharges into a canal system that then delivers the diverted water for irrigation purposes.

The amount of water diverted is dependent upon the runoff from the upstream basin, the efficiency of the diversion structure, and the efficiency of the 48-inch outlet pipe. The amount of runoff generated is up to Mother Nature, so that leaves the latter two items to maximize the irrigation potential of Little Dry Creek. As currently constructed, the diversion structure has a concrete wall topped with wood planks. These planks have had a history of being damaged by ice and debris to the point of breaking. Once a plank is breached, the volume of water being diverted decreases. The outlet pipe has several holes in the invert of it, which causes water to be lost to the ground during the diversion process and causes ice heaving in the winter due to the trapped water freezing. The slide gate is not functioning properly and does not allow very reliable control of the discharge.

The project as proposed will replace the wood planks with a permanent concrete wall, replace the 48-inch outlet pipe, replace the slide gate, and install a subsurface drain. These improvements will provide for a more reliable means to divert the valuable spring/early summer runoff and will greatly enhance the farm economy of this area.

Technical Assessment:

Project Background:

The Little Dry Water Users Association Irrigation Project is located approximately 30 miles southeast of Jordan, Montana. The diversion structure is located on Little Dry Creek near where Montana Road 462 crosses the creek. Little Dry Creek is a non-perennial flowing stream.

The original diversion structure, including the outlet headwall, headgate, and 48-inch outlet pipe, was constructed around 1936. In 1971 the diversion dam was reconstructed by DNRC. A concrete structure topped by 3-foot removable wooden planks was constructed. The outlet headwall, headgate, and outlet pipe were not replaced. Ice and debris have caused damage to the wooden planks and their wooden supports to the point of breaking. The outlet headwall concrete is eroding and cracking severely. Based on a recent groundwater study, it has been determined that nearby groundwater seeps around and in front of the downstream end of the outlet pipe, causing obstruction of the outlet during freezing temperature and subsequent spring runoff. DNRC owns the structure until the Little Dry Water Users Association pays off the DNRC investment. This agreement is spelled out in a marketing contract between DNRC and the water users association.

Technical Approach:

The project sponsor seeks funds to rehabilitate the Little Dry Creek Project diversion structure and outlet works to allow better control and management of the water for irrigation use. The project entails replacement of the 3-foot wooden top of the diversion dam with a permanent concrete extension. The concrete will be shaped to divert the impact of ice and debris to prevent damage. The existing outlet headwall will be replaced with another concrete headwall. The headgate will be replaced with a new, similar headgate. The 48-inch metal outlet pipe will be replaced with a new 48-inch more durable concrete pipe. The new outlet pipe and accompanying structures will be set at the same elevation as the existing pipe and structures. In addition, a subsurface drain will be installed to drain water away from the outlet pipe area. The wooden planks used in the bypass will be replaced with more durable concrete or aluminum planks.

The application indicates that the project schedule plans for completion of the project within 12 months after funding is obtained. The Little Dry Water Users Association, through in-kind services, will provide demolition of the existing outlet works and plank portion of the diversion dam. The project sponsor will contract with a consulting engineer to provide final project design, construction, and administration, and to contract with a contractor to perform the construction work.

Project Management:

The project sponsor will administer the grant contract. The application indicates that project coordination with the Little Dry Water Users Association will be done through a committee of its members. After consultant selection, a planning meeting will be held with the consultant, project sponsor, and Little Dry Water Users Association. A breakdown of responsibilities will be outlined and documented. Monthly meetings will then serve to determine if the project is on schedule.

Even though it is not indicated in the application, because the project is still owned by DNRC, coordination with the DNRC State Water Projects Bureau will be necessary regarding compliance with the marketing contract.

Financial Assessment:

RRGL Grant Costs

Professional/technical	\$ 11,300
Construction	79,750
Contingency	8,950
Total Grant Costs	\$100,000
Estimated Total Project Costs	\$110,500

RRGL Grant Share = 90.5%

The project sponsor will contribute \$1,000 for administration costs. The Little Dry Water Users Association will contribute \$9,500 for construction costs. Based on consultation with area concrete suppliers, concrete costs, a major portion of the construction costs, are reasonable and adequate. All other costs appear reasonable.

In general, matching funds/contributions are or will be secured, as the project sponsor and Little Dry Water Users Association will supply all. The application indicates \$1.00/acre will be assessed in support of project funding. It is indicated that seven water users (1,416 acres) will be served by the project. Water users currently pay \$3.50 per acre, but water is only available for a short time each spring.

Benefit Assessment:

The application indicates the long-term renewable resource benefits will be better management of water by better control of the diversion of water to the Little Dry Water Users Project. Although some water conservation may occur through elimination of leakage through the outlet pipe and headwall, no quantification is given. The project will allow water users to better manage the diversion of water with some potential for improvement in water-use efficiency.

The project will result in additional public benefits through the improvements in the viability of agricultural operators in the area.

Environmental Evaluation:

No long-term adverse environmental impacts should occur from the project. All work should take place only when no water is flowing in Little Dry Creek to avoid increased stream silt loading downstream.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 41

Applicant Name: Town of Drummond
Project Name: Sanitary Sewer Rehabilitation Project - Infiltration Abatement

Amount Requested: \$100,000 Grant

Other Funding Sources: \$292,850 TSEP Grant
 148,970 SRF Loan
 43,885 CDBG Grant
 10,175 EPA Advance of Allowance Grant

Estimated Total Project Cost: \$595,880

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

The Town of Drummond's original wastewater collection facility was installed in the mid 1940s and consists of 4-inch service lines, approximately 10,350 linear feet of 8-inch gravity collection line, and a 1.5-mile outfall line that discharged raw sewage to the Clark Fork River. In 1963, a lift station and single-cell, 8-acre facultative lagoon was added, which discharged treated wastewater to the Clark Fork.

Problem - The 1.5-mile outfall line picks up to 0.3 MGD of infiltration and inflow during times of the year. This is significant since flow from the town itself is measured at approximately 40,000 gpd. Short-circuiting is also a problem since the existing inlet line is leaking and only half of the lagoon cell is effectively used. The lift station is also beyond its intended design life and has design problems that equate to serious safety risks for the operator.

Proposed Solution - The town proposes to completely replace the 1.5-mile outfall line to the existing lift station to address the infiltration and inflow problem. Short-circuiting will be addressed by constructing a new inlet manhole at the northeast corner of the lagoon. The town may decide to address lift station concerns as part of this project by making necessary modification to wetwell access and by replacing the aging pumps and motors.

Technical Assessment:

Project Background:

The project is located in Drummond, Montana. The original wastewater system was constructed in the mid 1940s and consisted of service lines, gravity collection mains, and a 1.5- mile outfall line that discharged raw wastewater to the Clark Fork River. In 1963, a lift station and facultative treatment lagoon were added to provide treatment of wastewater prior to discharge. The 1.5-mile outfall line is in poor condition as evidenced by the high degree of infiltration evidenced in the system. The outfall experiences nearly 7 parts infiltrated water to each 1 part actual wastewater. This high infiltration rate results in higher pumping costs at the lift station and degrades the treatment efficiency of the lagoon. The outfall line needs to be replaced or rehabilitated. The lift station is also in poor condition and needs to be upgraded or replaced.

The project will replace the 1.5-mile outfall line and upgrade the existing lift station. This will eliminate the majority of the infiltration problem reducing pumping costs and increasing the treatment efficiency of the lagoon. The selected approach is technically feasible and will achieve the goals of the project. However, the selected alternative is not the approach recommended by the engineer who prepared the draft facility plan. The plan recommended a new lift station and a forced main (pressurized) to the lagoon. Although the selected alternative will address the infiltration problem, this alternative is technically inferior. The 1.5-mile gravity line proposed will require more maintenance and have a shorter service life. The reason the town chose this alternative is unclear.

Project Management:

Staff requirements and responsibilities for the project are adequately outlined and appear reasonable. There appears to be adequate funding in the project budget to effectively manage the project. The applicant has identified project management coordination issues and has a sound plan for coordination. Public input has been received on the project through a public hearing on the draft facility plan held in March 1998. No negative comments were received at that meeting. The applicant has adequately addressed measures for managing consultants and contractors responsible for major work tasks.

Financial Assessment:

RRGL Grant Costs

Construction	\$100,000
Total Grant Costs	\$100,000
Estimated Total Project Costs	\$595,880 RRGL Grant Share = 17%

The estimated cost of the project is \$595,880 and is to be funded with a \$292,850 TSEP grant, a \$100,000 RRGL grant, a \$43,885 CDBG grant, a \$10,175 EPA planning grant, and \$148,970 in SRF loan funds. The current user rate is \$14.87/user/month for debt service and operation and maintenance. The facility plan estimated the MHI to be \$15,208. Based on this MHI, the sewer target rate was calculated to be \$10.14 user/month. Based on the assumed funding scenario and the project cost presented in the facility plan, the proposed user cost is \$16.59 per month, which exceeds the target value by 63%.

All necessary costs appear to be included, and the costs appear to be reasonable and consistent with other projects of a similar nature. SRF funds are available at any time, so the timing of DNRC funds is not critical. The project is eligible for TSEP funds and CDBG funds and such funds would be available at about the same time as DNRC funds if the applicant is successful in obtaining those grants.

Benefit Assessment:

The project will result in reduced nutrient loading to the Clark Fork River. This will result in long-term conservation management and protection of a renewable resource. The project will benefit the residents of the town by helping their wastewater system to be in compliance with DEQ requirements. It will also benefit residents statewide by improving the water quality of the Clark Fork River and reducing power consumption.

Environmental Evaluation:

The project has no significant long-term adverse impacts to the environment. The only portion of the project that has potential environmental impacts is the replacement of an existing wastewater line from town to the treatment facility. The majority of this pipeline is in the 100-year floodplain. However, impacts will be related solely to construction efforts and will be short-term. Replacing the topsoil over backfield excavations and reseeding will mitigate short-term impacts. The applicant has contacted the DNRC Floodplain Management Section, U.S. Army Corps of Engineers, and USFWS regarding the project. Based on the various agency responses, the project appears eligible for permits and no significant issues were raised. It should be noted that the selected alternative will result in significantly more disturbance than the recommended alternative since it requires excavation and replacement of the out-fall. The recommended alternative would utilize the existing pipeline to carry the new force-main and would require only minimal excavation.

Funding Recommendation:

DNRC recommends funding of the entire \$100,000 requested. Grant funds for the project will be provided after DNRC approves a scope of work, administration, and a budget, and after matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws and shall ensure the project is designed in accordance with DEQ requirements.

Project No. 42

Applicant Name: Lake County Conservation District
Project Name: Forestry Implementation Project

Amount Requested:	\$100,000	Grant
Other Funding Sources:	\$100,000	Corporate Match
	4,009	Salish-Kootenai Tribes, In-kind
	3,079	Bitterroot RC&D, Inc., In-kind
	4,916	Headwaters RC&D, Inc., In-kind
	3,753	Northwest Regional RC&D, Inc., In-kind
	32,244	NRCS, In-kind
Estimated Total Project Cost:	\$248,001	
Amount Recommended:	\$ 100,000	

Project Abstract: (Prepared and submitted by applicant.)

Lake County Conservation District is proposing the implementation of a pilot carbon offset forestry program, which would support the energy sectors goals in emission reductions of CO₂ and provide financial support for tree planting and management activities on non-federal forest lands in Montana.

In response to the concern over increased CO₂ in the atmosphere, a number of U.S. energy companies have voluntarily formed public-private partnerships with federal and state governments and non-profit organizations to implement tree planting and management programs on non-federal forest lands. In return for providing a portion of the funding, energy companies secure carbon credits created by the sequestration of carbon dioxide from the atmosphere by the growing trees. Carbon credits are calculated through formulas used to estimate the projected growth of specific

tree species on a given site.

The USFS Intermountain Research Station has stated that one-third of Montana timberland area outside national forest lands, over 2.5 million acres, are poorly stocked or non-stocked. The single largest deterrent identified by federal and state foresters to reforestation and management practices on private lands in Montana is the cost of planting, its related activities, and management costs.

Non-federal forestlands, one of Montana's most important renewable resources will benefit by the creation of a new marketable commodity from forestlands in Montana, specifically carbon offset credits. Montana forest landowners would obtain revenue to replant and manage their forest stands while retaining ownership of the future forest products that can be harvested from the site. Environmental benefits include improved water quality and quantity, improved forest habitat, and decreased soil erosion.

Technical Assessment:

Project Background:

The Montana Carbon Offset Coalition is comprised of four non-profit economic development groups (including the Northwest Regional, Bitterroot, and Headwaters Resources conservation and development areas, Inc. (RC&Ds) and Montana Watershed Inc. (MWI), which in turn is comprised of Lake, Flathead, and Lincoln conservation districts) and the Confederated Salish and Kootenai Tribes. Under the sponsorship of Lake County Conservation District, the coalition is proposing to implement a pilot carbon offset forestry program. The concept has evolved as a response to the global concerns over increased release of CO₂, a greenhouse gas, into the atmosphere and involvement of the United States in international negotiations to address this issue. A number of groups, including the coalition, in both the United States and other "timber rich" countries are exploring the use and purchase of carbon credits by carbon emitting companies (CECs).

In tandem with the carbon credit concept, it has been recognized that as much as one-third of timber lands in Montana (outside national forest lands) are poorly or non-stocked. The coalition addresses the issues of reforestation and stand management on non-industrial private lands.

The coalition, with a HB223 grant, conducted a market/ feasibility study of the potential for a forestry-based carbon offset program in Montana. The study demonstrated the need for reforestation and management assistance throughout western Montana and the technical feasibility of carbon offset to satisfy energy company needs. A program model and implementation strategy was developed. The coalition feels that the pilot study is ready for implementation.

Technical Approach:

Although the project is well thought out and presented, there are key scientific and political uncertainties that may not make it possible for this project to come to fruition. The project is feasible on the small-scale level, but it is questionable on the large scale level necessary to meet the overall goal of decreasing green-house gas emissions to the atmosphere. However, if a carbon credit contract (discussed below) can be signed with an energy company, some uncertainty, at least as far as this pilot project is concerned, would be removed.

The proposed project is a pilot study, the goal of which is to develop a market-based carbon offset program in Montana. The objectives are, by July 1, 2001, to enroll a minimum of 700 acres of non-industrial private lands (about 15 landowners) in the carbon offset program through contracts

with CECs and to complete one urban forestry project in a western Montana community. The implementation plan would use grant funds, matching corporate funds, in-kind technical assistance, and contracted services to set the pilot project up with the long-range goal of establishing a self-sustaining program to be administered by MWI under the guidance of the coalition. The applicant outlines and documents the technical and financial aspects of the implementation plan very clearly. The level of effort is fully explained and reasonable.

The key difficulty with this project is the uncertainty of the acceptance by the United States or by international treaty that the forest-based carbon offset approach is valid. This was openly discussed. In part, this project is an effort to show the people of Montana and state and congressional delegations that this concept has natural resources and commodity-based values. One reviewer was less optimistic about the progress of this concept. Energy companies are negotiating carbon contracts and buying carbon credits at \$1-\$30/carbon credit, with the expectation that the offset approach will be adopted by the United States and that credits purchased now would be honored. This seems speculative at best.

In addition, to the political uncertainty, a number of other elements are questionable on the larger scale. The return funding to this project via corporate match and that would be used to develop a self-sustaining program is based on the carbon credit calculation and cost/acre to plant trees to arrive at a \$4.35/carbon credit. However, the carbon credit calculation used is only one of many that could be developed and it seems simplistic. Although the technical information provided supports the technical approach, the scientific basis for the approach is still being researched at the international level. The applicant points out in several places that there are no established standards or specifications for the development of carbon credits. Another reviewer suggested that a net gain in carbon sequestration would be more appropriate as a basis for carbon credit calculation, since soil and understory vegetation store significant carbon as well. Planting trees may (or may not) provide a significant increase in carbon storage over existing site conditions. This should be researched on a site-by-site basis.

Project Management:

The implementation schedule is reasonable, although it is still not clear if the CECs will agree to negotiate with the coalition. The applicant indicated that the coalition anticipates signing an "agreement to purchase" in early November (letter dated 7/24/98). Extensive research and development have been completed so that the project is poised to start when funding is available.

The applicant describes project management very carefully and completely. MWI would administer the project. The sample contracts describe the agreements and responsibilities between the landowner and the CEC. The NRCS contract forester would assist the landowner in developing a stand management plan and providing third-party verification of the value of carbon credits.

Financial Assessment:

RRGL Grant Costs

Administration	\$ 10,072
Professional Services	15,351
Contracted planting	69,577
Urban Forestry (trees)	5,000
Total Grant Costs	\$ 100,000

Estimated Total Project Costs \$ 248,001 RRGL Grant Share = 40%

The budget is very well developed, itemized and documented, and reasonably reflects project costs based on scope and task descriptions. About 700 acres would be planted at \$270/acre. Landowners must contribute 20% of the planting costs, upfront, above and beyond the costs shown in the budget. However, the corporate match of \$100,000 is dependent on CECs signing contracts with landowners through the coalition program. Because of the uncertainty of the forestry-based carbon offset approach at the national and international levels, there is no guarantee that the asking price will be achieved. In-kind services (staff project time) for NRCS, Confederated Salish and Kootenai Tribes, and RC&Ds staff is clearly displayed and reasonable. The overall cost/acre is \$354/acre.

Benefit Assessment:

Seven hundred acres on about 15 non-industrial private timberlands would be restocked by planting trees. Stands would be managed for a minimum of 80 years. One urban forestry project would be completed. Resource enhancement and management/development of renewable resources are minimal and difficult to gauge. Planting trees to offset carbon emission is not really replacing a non-renewable resource with a renewable one. Indirect economic benefits would accrue locally if the pilot project does generate a broad-based program in western Montana, but the direct benefits are to landowners, who, after a contract expires (estimated at 80 years), own the trees.

The applicant is promoting the concept of carbon sequestration via forestry by using this pilot project as the vehicle to promote development of a new commodity that is resource based. The direct resource benefits attributable to the pilot project are admittedly small. The benefits are indirect and would be accrued if the program were successful in the long term. Again, the uncertainty of the forestry-based carbon offset concept at the international level, the lack of standard procedures to calculate carbon credits and price per carbon credit, and unsecured corporate match for this pilot project result in few direct or quantifiable benefits to the public.

Environmental Evaluation:

The applicant has not addressed potential environmental impacts in any detail. The EA checklist notes only benefits. Potential benefits are mentioned, but only vague and unsubstantiated connections are made. A number of potential impacts and ramifications are identifiable, but without knowing project sites specifically, a complete evaluation is not possible at this time. Of biggest concern is that there are no criteria for land selection. There is no discussion of road building. The potential negative impacts from roads are well known. Other effects are discussed in file documents. On a programmatic level, potential direct and indirect impacts would likely be minor and short term. The project would not likely have significant, long-term adverse impacts on the human and physical environments.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. A detailed environmental checklist for each selected parcel will be provided to DNRC before each contract is signed between a landowner and CEC. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all

applicable BMPs in the design and construction/execution of this project.

Project No. 43

Applicant Name: Rae Water and Sewer District
Project Name: Wastewater Treatment System Improvements

Amount Requested: \$100,000 Grant

Other Funding Sources: \$200,000 CDBG Grant
500,000 TSEP Grant
161,700 RD Loan
10,000 Local Funding

Estimated Total Project Cost: \$971,700

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - The Rae Water and Sewer District incorporated on October 3, 1977. The district has long used irrigation (land application) for discharge of its wastewater. This is no longer an option and the district must find alternative means of complying with non-degradation regulations. The district has some of the highest water and sewer user fees in the state. Administrative Order No. WQ 96-02 requires that full compliance be realized by December 31, 1998. With approval of grants, an extension should be possible. There has been a delay in engineering because all six of the alternative treatments listed in the original facility plan have been demonstrated as not feasible. The option of sending waste to the City of Bozeman has twice been denied by the city. The district has funded two facility plans and a recent addendum.

Problem - The district has nowhere to discharge its wastewater effluent and it has excessive leakage from its lagoons. Furthermore, the district must come into compliance with the very strict non-degradation laws. Such treatment must include nitrate removal far beyond standard treatment, a very difficult task in cold climates.

Proposed Solution - In consideration of the difficulty in removing nitrates in lagoon systems in cold climates, the inability to continue land application, and the refusal by Bozeman to all the district's requests to use its facilities, the district's engineer has proposed to use a sequencing batch reactor. This system has been proven very effective for nitrate removal in similar climates. Treated water would be discharged to groundwater at a total nitrogen level less than 5 ppm. The system and sludge handling are described in the attached report by Allied Engineering. The cost is estimated at \$972,000.

Technical Assessment:

Project Background:

Significant effort has been dedicated to exploring alternatives for resolving Rae's wastewater problems. Three facilities planning documents have been prepared, with the first two recommended alternatives being declared unworkable. DEQ issued an Administrative Compliance Order in December 1996 requiring the district to rectify significant lagoon leakage. The latest planning document represents the culmination of Rae's planning effort. The existing facilities are marginally described in the application. The existing lagoons are to be abandoned and the new facility will occupy the existing site.

The primary issues driving this project are the Administrative Compliance Order and also the loss of the district's spray irrigation site. The treatment and disposal method proposed by the district will rectify the leaking lagoons and thus, should achieve compliance with the order. Going to a groundwater infiltration gallery will also provide a suitable means of disposal in lieu of spray irrigation. The system will be required to comply with the state's non-degradation rules and statute for discharging treated wastewater to the groundwater.

Technical Approach:

The selected alternative will solve the problem with leaking lagoons by replacing the current treatment process with a mechanical treatment process known as a sequencing batch reactor or SBR. The SBR is an activated sludge treatment technology where all of the treatment occurs within a single basin. Wastewater is introduced into the basin, aerated and mixed, then allowed to settle. Clarified wastewater is drawn from the basin for ultimate discharge. Accumulated sludges are drawn from the bottom of the basin for recirculation with raw wastewater, and also for digestion and disposal. The SBR technology, while unproven in Montana, has been tested in similar cold climates. Data collected from other installations show that SBR effluent nitrate concentrations are typically less than 5 mg/l, which implies the new system could be declared as non-significant under non-degradation. These data, however, do not include monitoring for organic nitrogen (a component of total nitrogen), and therefore are not conclusive in terms of meeting an annual load limit for total nitrogen discharged to groundwater. The disposal method proposed by the applicant is a series of open-bottom infiltration chambers that will introduce treated wastewater into the groundwater.

Project Management:

The district has hired a grant administrative consultant to act as primary grant administrator in conjunction with the district's own secretarial staff. Level of effort and cost appears more than sufficient to manage a project with four funding sources. Coordination and timing of each funding component has been considered in formulating the project schedule. Previous public input consists of two public hearings (adequately advertised), the latest held in April 1998, at which project scope and costs and anticipated user rates were discussed. The public is invited to all board meetings to engage in discussions on project progress and user rate impacts.

Financial Assessment:

RRGL Grant Costs

Construction	\$ 91,000
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Construction Contingencies	9,000
Total Grant Costs	\$100,000
Estimated Total Project Costs	\$971,700

RRGL Grant Share = 10.29%

The estimated \$971,700 project is to be funded with CDBG, TSEP, and DNRC grants; a \$161,700 Rural Development loan; and \$10,000 in local contributions. Rates are proposed to be increased from \$67.98 per residential user month to \$71.73 if funding is obtained as applied for. This exceeds target rates for the state. Funding applications are pending, and the district has discussed the loan with Rural Development and they appear to be an eligible candidate. Construction cost (\$711,200) appears to include infiltration study, although this (\$12,500) is accounted for separately. Cost analysis for sludge removal was not provided and the estimate could be quite low if all sludge is to be removed.

Benefit Assessment:

Rectifying the severely leaking lagoons will improve the groundwater resource by providing adequate treatment prior to discharge. Enhancing groundwater aquifer quality could prove beneficial to future Montanans. Two public hearings have been held with no adverse opinions received. Most constituents appear to support the project despite very high user rates. The benefits are likely to be confined to the immediate area downgradient of existing lagoons.

Environmental Evaluation:

The applicant has indicated that elevated nutrient and fecal coliform levels have been detected in the lagoon underdrain, although it is unclear from which lagoon this originates or where it goes. It is difficult to determine from the information provided whether groundwater impacts are documented. However, leakage rates of 45 inches to 858 inches per year would imply that impacts are likely. This project will result in typical construction related short-term adverse environmental impacts that cannot be entirely avoided in any construction project. Construction impacts must be identified and mitigated to the extent possible. No long-term adverse environmental impacts are anticipated.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 44

Applicant Name: Canyon Creek Irrigation District
Project Name: Canyon Lake and Wyant Lake Dams Restoration Project

Amount Requested: \$ 320,000 DNRC Grant

Other Funding Sources: \$ 15,000 District Construction Fund
60.000 In-kind services

Estimated Total Project Cost: \$ 395,000

Amount Recommended: \$100,000 DNRC Grant
\$ 227,000 DNRC Loan

Project Abstract: (Prepared and submitted by applicant.)

The dams in the Canyon Creek drainage (Canyon Lake Dam and Wyant Lake Dam) store midsummer snowmelt water for irrigation use during the late summer. This design and construction project is meant to bring the "high-hazard" dams up to present state and federal dam safety standards, to ease maintenance and operation difficulties, and to allow for a more effective use of the water. The project will reduce the occurrence and probability of water overtopping the dams, protect embankments against wave and driftwood damage, protect against internal erosion, and rehabilitate failing outlet conduits and intake sumps. The existence of these dams reduces the potential of property and environmental damage, and loss of life through flood control.

Off-site benefits include more efficient use of irrigation water, groundwater recharge, reduced flood peak flows, and increased late summer stream flows for fish.

These dams are constructed on alpine lakes converted to reservoirs located in the Selway-Bitterroot Wilderness at the headwaters of Canyon Creek, eight miles due west of Hamilton, Montana. The project is designed to minimize environmental disturbance to the surrounding wilderness to the extent technically and economically feasible. The two reservoirs store approximately 700 acre-feet of water, which provides crucial late season water to 1,500 acres owned by 125 members of the district. The removal of sediment and debris that has collected over the last 80 to 100 years in three reservoir basins will allow for the recovery of up to 10 feet of water storage. The dams are over 100 years old and when rehabilitated and restored, could last another 100 years. The five-mile long primitive access route to the dams ascends over 2,000 feet into a cirque. This steep access route, over large boulder talus, has deteriorated and is impassable to pack stock. All significant material and equipment must be flown in by helicopter.

Technical Assessment:

Project Background:

Canyon Creek Dam is 23 feet high and 430 feet long and was constructed in 1891. The Wyant Lake Dam was constructed in 1910 and is 18 feet high and 400 feet long. The Canyon Creek Irrigation District is the owner of the dams under Congressional authority and has valid water rights for the dams under Montana Water Law.

In July of 1996, the Canyon Lake Dam overtopped during a high snowmelt event. As a result, a reach of the dam was eroded to a depth of 20% of the dam's height. This damage was repaired in

1996. However, during the course of the repairs, it became evident that both dams have deteriorated and require rehabilitation to meet current dam safety standards.

Both dams need repairs to the outlet works and spillway and need erosion control measures implemented. Both dams have been classified as high-hazard dams as they feed Canyon Creek, which passes through the suburban outskirts of Hamilton.

Technical Approach:

The main goal of this project is to rehabilitate the dams to meet the safety standards outlined in the Montana Dam Safety Act. The project will be designed to minimize environmental impacts and to ensure an adequate and timely supply of irrigation water to the owners.

Recommendations to upgrade Canyon Creek Dam include raising a low portion of the crest to provide uniform freeboard, repairing a collapsed section of the outlet works, completing erosion control measures, constructing an additional spillway at a location free of drifting snow, and repairing the intake structure. A spillway capacity analysis and spillway upgrades (if needed) are also recommended.

Recommendations to upgrade Wyant Lake Dam include raising low reaches of the crest to provide uniform freeboard, repairing the outlet works, repairing the dam embankment, completing erosion control measures, repairing the log boom, and repairing the inlet structure. A spillway capacity analysis and spillway upgrades (if needed) are also recommended.

Two alternatives were evaluated: 1) the no-action alternative, which would require that the dams be breached for public safety, and 2) perform the needed repairs. Breaching the dams would be more expensive than performing the needed repairs and would not meet the goal of ensuring a source of irrigation water.

The applicant has provided a list of the required permits that will need to be obtained to complete the project. This list appears to be adequate. The applicant has also anticipated the possibility of legal action to contest the project because it is located in a designated wilderness area.

The project schedule appears feasible. Construction is scheduled to start in September 1999 after the snowmelt and may have to continue for one or two more summers because of the short construction season. The construction has been phased to take into account the short construction season.

The selected approach is to perform the required repairs while minimizing environmental impacts. Equipment and materials will be brought in by helicopter, manmade structures will be designed to blend in with the surroundings and measures will be taken to prevent spills.

The project is technically feasible. There is a possibility that legal action may delay or cancel the project, but the applicant has taken this into consideration.

Project Management:

Staff requirements have been outlined for the project management team. Project implementation will require coordination between USFS, the project management team, and possibly with local environmental groups. These coordination matters have been taken into consideration. The applicant has identified measures for managing consultants and contractors. The overall project

management approach appears to be adequate.

Financial Assessment:

RRGL Grant Costs

Administration	\$5,000
Engineering	25,000
Contracted Services (Helicopter)	70,000
Total Grant Costs	\$ 100,000

RRGL Loan Costs

Construction	162,000
Legal fees	31,000
Contingency	27,000
Loan Administration 3%	7,000
Total Loan Costs	227,000

Estimated Total Project Costs \$402,000 RRGL Grant Share=25% / RRGL Loan Share=56%

The budgets for program costs and projects both appear to be adequate based on the costs provided in the application. The applicant has requested a DNRC grant that totals \$320,000. However, the maximum grant available is \$100,000. This aspect was discussed with the applicant's representatives, but it is not clear if the applicant can afford to undertake the project if a portion of the funds have to be borrowed. The project sponsor intends to provide \$75,000 in matching funds; \$15,000 of this amount will be taken from the district's construction fund, which is funded by user fees. The rest will be from in-kind services from district members. The district currently services 125 users on 1,424 acres. User fees amount to \$5.50 per acre. The district will assess a one-time fee of \$114.00 per user in support of project funding.

Benefit Assessment:

The project will improve the storage capacity of the existing dams for irrigation and for the maintenance of instream flows in the summer. This project will provide some flood protection and reduce streambank erosion by reducing runoff flows. Recreational opportunities will be enhanced by maintaining instream flows and from the lakes formed by the dams. The benefits will be long term, lasting as long as the dams are in place.

Environmental Evaluation:

The project is located within the boundaries of a wilderness area; consequently, steps have been taken to minimize the impacts of the project. Equipment and materials will be transported by helicopter, and manmade structures will be designed to blend with the environment. The long-term environmental impact caused by this project should be minimal. USFS will conduct the required environmental assessment for dam rehabilitation in a designated wilderness area.

Funding Recommendation:

DNRC recommends grant funding of \$100,000. The balance of the requested amount will be made available as a loan of 226,600. Grant and loan funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 45

Applicant Name: Montana Department of Environmental Quality
Project Name: Direct Planning Grants to Small Communities in Need

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 81,818 45% Matching Contribution by Grant Recipients

Estimated Total Project Cost: \$ 181,818

Amount Recommended: \$ 100,000

Project Abstract: (Prepared and submitted by applicant.)

DEQ has provided planning grants to small, needy Montana communities since 1985 for water pollution control projects. These grants have partially funded facility plans that identify community environmental sanitation needs and outline options to address those needs. The most recent grant application (March 1996) was amended to include drinking water system planning as well as planning for environmental sanitation needs. For this grant cycle, funding for the water pollution control activities is not being sought because EPA has made money available to DEQ for this purpose. However, communities have not had access to similar funding for drinking water projects. Therefore, the need for funding drinking water system planning still exists.

This grant will help DEQ continue to provide critical funding for Montana communities that need facility planning assistance. DEQ proposes to use the same formula that has been used in the past: 55% grant, no single grant to exceed \$10,000 and 45% local match required to meet the full cost of a facility plan. This funding will assist communities to:

- Evaluate drinking water infrastructure and prioritize needs;
- Focus energy and finances in appropriate priority areas; and
- Develop systematic plans for addressing current and future drinking water infrastructure needs.

Drinking water infrastructure needs exist in many areas of the state and for many different components of the infrastructure. A number of public water supplies in Montana have unnecessary public health risks and difficulty complying with the Safe Drinking Water Act because of source water quality problems; inadequate, outdated, and aging treatment systems or equipment; inadequate storage; and leaking or failing distribution systems. A 1995 needs survey report to Congress estimated the total need in Montana for drinking water infrastructure at \$290 million.

Technical Assessment:

Project Background:

As stated in the project abstract, DEQ has provided planning grants limited to 55% of the cost of the planning study up to \$10,000 for wastewater projects since 1985. Those grants have been administered by the Wastewater State Revolving Fund Loan Program, now known as the Water Pollution Control State Revolving Fund Loan Program. Except for a \$100,000 Renewable Resource Grant authorized by the Legislature in 1997, funding for the grants has been provided by EPA.

Montana's Drinking Water State Revolving Fund Loan Program was established early in 1998. No EPA funding is currently available to this program for planning grants. The purpose of this application is to seek funding for planning grants to be administered by the Drinking Water State Revolving Fund Loan (DWSRF) Program.

Technical Approach:

DEQ proposes to continue the funding of planning activities for small communities in need of drinking water infrastructure improvements. The goals are, through appropriate planning, to increase public health protection by improving Montana's drinking water infrastructure.

The specific objectives of this project are to provide small planning grants to ten or more public water supplies from a \$100,000 Renewable Resource Grant award. This program provides incentives for communities to conduct appropriate drinking water system planning efforts and encourages communities to address water system problems. It has been shown that the preparation of planning documents greatly increases the likelihood of communities to receive state and federal assistance for the construction of drinking water facilities.

Project Management:

Planning grants, as proposed in this application, would be administered by existing DEQ staff assigned to the Drinking Water State Revolving Fund Loan Program. Included are four engineers and support staff. No funding is being sought by DEQ to fund its staff.

Financial Assessment:

RRGL Grant Costs

Grants to communities \$100,000

Total Grant Costs \$100,000

Estimated Total Project Costs \$181,818 RRGL Grant Share=55%

Planning grants have traditionally (since 1985) provided 55% of the cost of preliminary engineering up to a maximum of \$10,000. The average total cost of a preliminary study and the preparation of a facility plan usually do not exceed \$20,000. RRGL grant costs represent 55% of the total project costs associated with ten studies. The remaining 45% (\$81,818) would be provided by each community applicant.

EPA does not provide funding for planning grants through the newly organized Drinking Water SRF Program. DEQ desires to provide planning grants for drinking water system improvements throughout Montana. Until funding is obtained, that goal cannot be attained.

Benefit Assessment:

An engineering study and the preparation of a facility plan are the first step in investigating the need for improvements to a public works facility such as a drinking water system. Included in a facility plan is a systematic evaluation of alternatives that consider the unique characteristics of the community. Because these funds will be available to needy communities statewide, the potential public benefits are considerable. Infrastructure funding is virtually unavailable without the completion of sufficient planning documents. These grants will make the planning process more affordable so that communities can effectively identify infrastructure needs and the most cost-effective way to achieve those improvements. These grants also help to offset the costs of determining whether the community will qualify for state and federal funding.

Environmental Evaluation:

The proposed project is for DEQ to provide small planning grants directly to small, needy Montana communities. Each community will use its grant to prepare a facility plan, which will outline alternatives for improvements to its public drinking water system. An environmental assessment will be conducted for each proposed project during the design process.

Funding Recommendation:

DNRC recommends grant funding of the total amount requested, \$100,000. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 46

Applicant Name: Chinook Division Irrigation Association

Project Name: Rehabilitation and Betterment of Water Conveyance Systems

Amount Requested: \$100,000 Grant

Other Funding Sources: \$ 40,590 Chinook Division Irrigation Association

Estimated Total Project Cost: \$140,590

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

The Chinook Division of the Milk River Project needs to upgrade some of its water conveyance systems. Some of this work has been accomplished in the last five years, but more work is necessary to ensure that the water conveyance systems are more efficient in delivering water than

they have been in the past. To achieve this, the Chinook Division proposes to retard the seepage of water from its canals and laterals by the installation of lining in and adjacent to the canals and laterals, and the installation of measuring devices on some of the canals.

There are several types of lining materials being considered for this proposal. They consist of PVC lining across the whole canal prism; a vertical PVC curtain adjacent to the canal; and bentonite lining across the whole canal prism. The measuring devices considered are rectangular weir structures.

The lining of various sections of the canals and laterals will eliminate seepage and conserve water, which is in very short supply all along the Milk River. The elimination of seepage will also allow the landowners to reclaim land adjacent to the ditches, which had become covered by alkali caused by the seepage from the ditches. The addition of measuring devices will allow the districts to keep better control of their water supply so that waste is eliminated.

The benefits of this program will help not only water users of the Chinook Division, but water users along the Milk River downstream from the Chinook Division who will benefit from more water being available to them from the conservation of water by the Chinook Division. The property owners in the town of Chinook who are adjacent to the Miller Lateral will benefit from not having their property flooded during the irrigation season.

Technical Assessment:

Project Background:

The irrigation association is comprised of five irrigation districts located in north central Montana. Water is diverted from the Milk River for irrigation of 37,273 acres. The work proposed is part of an overall plan to increase water-use efficiency in the Milk River Basin irrigation system. The application indicates that Milk River irrigators experience water shortages six out of ten years due to drought, over development of the water supply, and an aging, inefficient distribution system.

Technical Approach:

The project entails lining four different sections of main canal, lining three different sections of lateral ditches, installing three weir structures, and blading a road along one section of the canal. The application indicates that different sections of canal or lateral will be lined with different types/methods of lining ranging from vertical PVC plastic adjacent to the canal to PVC plastic across the entire canal prism to bentonite across the entire canal prism. Cost and convenience are the reasons given for using different types/methods of lining for the different canal and lateral sections. No other alternatives for each of the sections were provided. More information should have been provided regarding the site-specific characteristics to justify the chosen type/method of linings. Reviewers also indicated that no information was presented regarding quantification of seepage losses at the selected lining sites to explain why they were chosen over other canal and lateral sections or over other water-use efficiency measures; i.e., on-farm water management. Similarly, no indication is given why weir structures were chosen over other measuring devices or why the chosen weir location sites were selected over other sites.

The application indicates that the work will be done by local contractors and by force account of the individual irrigation districts. Although it is indicated that no design is necessary, one reviewer pointed out that a design should be required in which the different site-specific characteristics and circumstances are factored in, such as slope stability (i.e., will saturated canal bank slopes hold

the overburden on top of the lining?). Work is expected to begin in the fall of 1999 after the irrigation season as soon as funds are available. It will continue, if necessary, into the spring and fall of the year 2000.

Project Management:

No indication is given as to staff that will manage/administer the grant contract or project implementation. No measures are indicated regarding coordination among the irrigation districts, with the contractor, or with USBR if involved.

Financial Assessment:

RRGL Grant Costs

Materials	\$ 47,670
Construction	52,330

Total Grant Costs	\$100,000
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Estimated Total Project Costs	\$140,590	RRGL Grant Share = 71%
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The project sponsor will contribute \$37,590 for construction costs, \$2,000 for engineering costs, and \$1,000 for administration costs. The budget is somewhat unclear regarding specifically what is included in some of the lining cost figures. In addition, it appears no funds are budgeted for contingencies regarding the lining work. As design of the work will be required, the \$2,000 budgeted for engineering costs is probably not sufficient.

All matching funds/contributions will be secured from the assessment to water users. The application states an assessment of \$150/user will provide the support for the project. The application indicates that 250 water users will be served by the project.

Benefit Assessment:

The application indicates long-term renewable resource benefits will be increased efficiency of water use and water conservation from improvement of water conveyance efficiencies in the irrigation association system. The measuring devices (weirs) should provide for better management of the water in the irrigation system if used properly. No quantification of any of these renewable resource benefits is given.

The application indicates that the project will provide ongoing public benefits by allowing more water to be available in the Milk River, a water short stream. These benefits are measurable but no measurements or method of measurement are stated. It is stated that residents of the town of Chinook adjacent to one section of lateral to be lined should see an elimination of deterioration of houses and sewer systems due to irrigation system water seepage.

Environmental Evaluation:

Some wetland resources will be adversely affected as a result of project implementation. However, improvements to water quality and conservation should offset impacts to these resources. An environmental assessment will be completed prior to conducting any activities that will affect wetland resources. An assessment to evaluate the project site for the presence of threatened or

endangered species as well as cultural resources will be conducted prior to project implementation. Measures to lessen the impacts to wetland resources will be evaluated prior to project implementation.

Funding Recommendation:

DNRC recommends grant funding of \$100,000. Grant funds for the project will be provided after DNRC approves a scope of work, project administration, project budget, and after all matching funds necessary to complete the project are secured. The applicant shall conduct all activities associated with the project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and implementation of this project.

The applicant shall evaluate impacts to wetland resources resulting from the project prior to project implementation. A plan that identifies measures to lessen impacts to wetland resources shall be submitted to DNRC prior to entering into a grant agreement to receive project funding.

Project No. 47

Applicant Name: Montana Department of Natural Resources and Conservation
Project Name: Missouri Pipe Span Rehabilitation Project

Amount Requested: \$100,000 RRGL Grant
 409,426 RRGL Loan

Estimated Total Project Cost: \$509,426

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

The Broadwater-Missouri Irrigation Project is located about five miles south of Toston, Montana, in Broadwater County. The project is operated and maintained by the Broadwater-Missouri Water Users Association (BMWUA). The project consists of the Toston Dam on the Missouri River, a main canal (1.5 miles), a west canal (12.3 miles), and an east canal (34.3 miles). At the end of the main canal below the dam, a 7-foot diameter steel pipe supplies 262 cfs of water to the east canal. The pipe is 666 feet long, of which 454 feet is suspended over the Missouri River on four piers, and 212 feet runs underground, passing under the Montana RailLink Railroad.

The pipe is lined with a coal tar product and externally painted with red lead primer and reflective aluminum topcoat. The steel pipe is exhibiting corrosion, both internally and externally. BMWUA has determined that the pipe span needs to be relined on the interior because the interior coating has failed and the exterior needs to be repainted. The pipe is structurally sound and resurfacing the interior and exterior of the pipe will extend its usable life for another 20 to 30 years. The project supplies irrigation waters to irrigate 23,635 acres of wheat, barley, hay, and lentil beans.

DNRC is requesting a loan and grant combination totaling \$509,426 to recoat the inside and outside of the 7-foot diameter steel pipe span, repair and upgrade the expansion joint, replace the walkway, and install cathodic protection.

Technical Assessment:

Project Background:

The Missouri River pipe span was constructed in 1940. This project will address the pipe span that crosses the Missouri River. This span was re-coated during the 1960s. The project will address identified maintenance measures to the pipe span recommended to maintain the existing level of service to the BMWUA.

In addition to the 23,635 acres of irrigation, water from the project also is used to enhance stream flows for fishery projects in Dry Creek, Deep Creek, and Crow Creek.

Technical Approach:

The goal of this project is to perform necessary maintenance operations on the Missouri River pipe span to extend the Broadwater-Missouri Irrigation Project 20 to 30 years. The pipe span is structurally sound and in operable condition. However, corrosion protection measures have been identified as necessary in order to extend the life of the pipe and the irrigation network that relies on water supplied by the structure. The pipe span will be reconditioned by cleaning the rusted areas to bare metal on the exterior of the pipe and repainting with one of seven paint systems. The interior of the pipe will be reconditioned by the removal of the failed existing coal tar material, cleaning the interior surface to bare metal, and recoating with zinc or zinc/aluminum material. The expansion joint will be cleaned, repaired, upgraded, and repainted. Cathodic protection will be added to the buried portion of the pipe and the wooded walkway on top of the pipe will be replaced.

The applicants propose to complete the proposed improvements during the 1999 and/or 2000 construction seasons. A professional consultant will design the improvements.

Project Management:

Project management will be provided by the DNRC Water Resources Division office in Helena. DNRC is familiar with public bidding and procurement statutes and will advertise and bid any outside services for this project accordingly. Wage and labor standards will be strictly enforced.

Financial Assessment:

RRGL Grant Costs

Administration Costs	\$ 9,794
Construction Costs	92,091
Total Grant Costs	\$100,000

RRGL Loan Costs

Administration Costs	\$ 41,063
Construction Costs	368,363
Total Loan Costs	\$ 409,426

Estimated Total Project Costs \$ 509,426 RRGL Grant Share = 20% / RRGL Loan Share = 80%

The identified cost of the project includes professional services, labor, materials, contingency, and inflation. Unit costs are reasonable, and the project budget is well justified. The water users are currently paying \$1.00 per acre-foot of irrigation water delivered for the Missouri River pipe span rehabilitation. The rate will be increased to \$1.64 per acre-foot of irrigation water delivered to cover debt retirement for a 20-year loan.

Benefit Assessment:

Completion of improvements will allow continued operation of the Broadwater-Missouri Irrigation Project at current levels. The project will directly benefit 98 irrigation district members. The project will also benefit fish and wildlife through the continued delivery of water to Dry Creek and Deep Creek to enhance fishery values. The uninterrupted delivery of water for irrigation is essential to the ongoing viability of agricultural production in the area.

Environmental Evaluation:

This project will result in typical construction related short-term adverse environmental impacts that cannot be entirely avoided in any construction project. Special consideration will be made to address the safe removal of the lead paint that currently covers the pipe span. Construction impacts must be identified and mitigated to the extent possible. No long-term adverse environmental impacts are anticipated.

Funding Recommendation:

DNRC recommends grant funding of \$100,000. The balance of the requested amount will be made available as a loan of 409,426. Grant and loan funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 48

Applicant Name: City of Big Timber
Project Name: Lagoon Reconstruction and Lining

Amount Requested: \$100,000 **Grant**

Other Funding Sources: \$500,000 TSEP Grant
 400,000 CDBG Grant
 693,887 SRF Loan
 102,388 City Funds

Estimated Total Project Cost: \$1,796,275

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - The City of Big Timber has taken a very strong stand to improve known violations of state standards occurring as a result of inadequate treatment of wastewater. In 1997, the city hired Morrison Maierle to continue work on the facility plan. The city has conducted a needs assessment and held several hearings on water and sewer issues and determined wastewater treatment to be its highest priority.

Problem - The City of Big Timber has experienced problems with its wastewater treatment and distribution system. Problems have been very long term, especially the leakage of the lagoon. In 1997, Morrison Maierle studied flows entering and leaving the lagoons and found that 70 % of the water entering the lagoon leaves by leakage out the bottom. High nitrates (greater than 7 ppm) have been found in a nearby observation well. There were three recorded violations of the discharge permit previous to 1995, but these violations have been accelerating, with ten additional violations of the city's discharge permit since 1995 (including in April 1998). These violations are all for excessive BOD and TSS in the discharge due to lack of adequate treatment. Finally, an engineer has noted that significant upgrades are required at two lift stations, and there are problems with deteriorated sewage collection pipe.

Proposed Solution - Morrison Maierle proposes to divide and line the lagoons and provide improved aeration. Morrison Maierle has also identified improvements necessary to the lift stations to bring them up to state standards and set a priority list for sewer lines that require replacement. Tom Slovarp of DEQ has commented that all improvements are related to public health and safety concerns. The city has adopted a ten-year capital improvements plan and raised sewer rates a total of 180 % since 1994 to help pay for improvements.

Technical Assessment:

Project Background:

The City of Big Timber has undertaken a planning effort to evaluate the wastewater treatment and collection system. This study resulted in the identification of important existing needs. The lagoon system regularly violates the permit to discharge and is in need of major improvements. A documented impact to underlying groundwater has been established. The proposed facilities includes a new lagoon system built adjacent to the existing lagoon and limited improvements to a portion of the collection system, including rehabilitation of a lift station. The financial package for this project is complex, involving three grant programs and one loan program, and is designed to keep the resultant user rates affordable.

Technical Approach:

The technical approach for this project is to build a new aerated lagoon system located adjacent to the existing lagoon. This approach would allow the construction of a new system while keeping the existing system in operation. On an overall basis, it is believed that the selected option is technically feasible, cost-effective, and the appropriate choice. The original planning document (completed in 1995, then amended significantly in 1998) is difficult to follow and leads to a number of questions. Absent a more coherent planning document, it is difficult to evaluate the application's technical merit. The basis for determination of unit costs in the amended plan is not well supported and provides a questionable economic analysis.

The option selected for construction is feasible and will provide a long-term solution for the

community's wastewater treatment needs. No significant permit or legal issues are anticipated that would affect the project. The schedule for construction is appropriate and achievable. Costs estimated for operation and maintenance are underestimated. The DEQ review engineer supports the project and the chosen alternative.

Project Management:

The project management plan and structure provided in the application addresses the important aspects of providing good project management for this project. A project management consulting firm, the town clerk, and consulting engineering all have roles in project administration that were well described in the application. Little information, other than the required public meetings, was included in the application showing public involvement in the project implementation process. Some aspects of project management appear to be redundant in services provided by the project manager, the town clerk and the consulting engineer. Adequate budget was provided for local involvement of city staff in the project.

Financial Assessment:

RRGL Grant Costs

Construction	\$90,000
Engineering	10,000
Total Grant Costs	\$100,000

Estimated Total Project Costs \$1,796,275 RRGL Grant Share = 5.57%

The methods for estimating construction costs are not adequately supported, use a questionable basis for establishing unit prices, and do not provide a properly calculated present worth economic analysis. Irrespective of these issues, it appears that the proper alternative was selected for construction and that adequate funding exists in the project budget to support the recommended alternative. The other aspects of the project budget are appropriate and the schedule appears to be feasible. The proposed budget allows for 55% of the project costs to be provided with grant funding and the remainder will be borrowed.

Benefit Assessment:

This project will provide significant public benefit and resource protection through the construction of a well-designed wastewater treatment system. The leakage of marginally treated wastewater into underlying groundwater will cease, as will the discharge of poorly treated wastewater into the Boulder River. Supplemental to this project, the city has enacted ordinances to encourage the conservation of water, which will reduce the discharge of wastewater and improve treatment performance of the lagoon system. The project provides multiple benefits for the citizens of Big Timber as well as the downstream users of the Boulder and Yellowstone rivers. The benefits of improved water quality will be both long and short term and can be quantified by the monitoring required of the discharge to the surface water and sampling of the groundwater well located near the existing lagoon.

Environmental Evaluation:

This project will result in typical construction related short-term adverse environmental impacts that

cannot be entirely avoided in any construction project. Construction impacts must be identified and mitigated to the extent possible. No long-term adverse environmental impacts are anticipated. An increasing trend in violations of the conditions of the permit to discharge to the Boulder River has been noted. The proposed project will address those violations and minimize any leakage to groundwater.

Funding Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 49

Applicant Name: LaCasa Grande Estates Water and Sewer District
Project Name: New Water Supply System

Amount Requested: \$100,000 **Grant**

Other Funding Sources: \$500,000 TSEP Grant
 \$445,000 SRF Loan

Estimated Total Project Cost: \$1,045,000

Amount Recommended: \$100,000

Project Abstract: (Prepared and submitted by applicant.)

LaCasa Grande Estates is a residential subdivision located adjacent to the City of East Helena, Montana. The population of LaCasa Grande Estates is estimated at 500 to 600 people.

The existing water system was constructed in late 1970s as part of the development of the LaCasa Grande Estates subdivision. The existing water system has in the past suffered from an insufficient water supply. In order to maintain water pressure within the system, landscape irrigation is severely limited by the water company. The current system only marginally complies with existing state requirements. LaCasa Grande fire protection is minimal at best. The East Valley Volunteer Fire Department does not recognize this water system as a useable source for fire suppression.

The soil surface in the subdivision has been subject to significant heavy metal pollution (lead, cadmium, and arsenic) associated with the operation of the ASARCO lead smelter in East Helena. Lead levels in the surface soil of LaCasa Grande are extremely high. Even after the replacement of surface soil at 32 lots, 53 lots contain at least one sampling section with lead concentrations in excess of 1,000 parts per million (ppm). Another 55 lots contain at least one sampling section with lead concentrations in excess of 500 ppm. This level of lead contamination of surface soils may result in adverse health impacts to children.

The proposed project will mitigate the lead contamination by encouraging the irrigation of lawns and

ground cover that minimize dust emission and create a barrier to direct dermal contact with the lead contamination. Irrigation is also necessary to restore vegetation to those lots that have been stripped of the lead-contaminated soil.

The residents of LaCasa Grande Estates would like a sufficient water supply for personal use as well as needed pressure for adequate fire protection for public safety, and have elected to pay for construction of a new water system.

Technical Assessment:

Project Background:

The project is located in the LaCasa Grande Water and Sewer District, a developed residential area of about 550 people located north of East Helena. Presently, the community is served by a private water system, built during the initial development, which has inadequately sized lines, marginal storage, and is incapable of providing adequate water during high demand periods. Water restrictions are regularly in effect and landscape irrigation is restricted, which aggravates a public health problem with lead-contaminated dust. The system also cannot provide adequate flows for fighting fires. Negotiations with the current owner of the system for improvements have been fruitless. A water and sewer district was formed to find a solution to the problem of inadequate water.

Technical Approach:

The approach toward solving the problem is to build a new distribution system and 100,000-gallon storage tank. One well, built with BLM funds, would be retained from the existing system and another new well drilled. New service lines and fire hydrants would be included in the project. The new system would meet all anticipated demands, including those required for appropriate fire protection. The proposed technical solution provides what may be the only viable solution to the District's water supply needs. It appears the owner of the private water system is unwilling to sell the system or make the necessary improvements. City officials have denied connection to the nearby City of East Helena. The proposed option of building a new distribution system, storage tank, and one new well is viable, meets current regulatory standards, and enjoys the support of the district residents. With a complete new water system, the inclusion of water meters into the project would have benefited the project and encouraged better use of water. Legal issues remain regarding water rights and obtaining possession of the existing well built with public funds and located on public lands. The district has an attorney who has considered these issues and believes they will not present insurmountable obstacles. The proposed schedule is viable.

Project Management:

The project management plan provided in the application is viable and addresses the salient issues regarding implementation of this project. Limited project coordination is required and adequate. Staffing to administer the project has been identified. Public input was provided on the project during the planning stage through the use of surveys. Measures identified for management of contractors and consultants are appropriate. The members of the district board and hired consultants will provide the necessary project management.

Financial Assessment:

RRGL Grant Costs

Professional Services	\$ 5,000
Audit Fees	1,000
Construction	94,000
Total Grant Costs	\$ 100,000

Estimated Total Project Costs \$ 1,045,000 RRGL Grant Share = 9.57%

The financing plan for this project is viable, if the requested applications for financial assistance are successful. Costs are based on building a new distribution system, and steel storage tank, and obtaining an existing well, with present ownership of the well in question. This proposed option, while financially feasible, is not the least-cost alternative. Less expensive alternatives require sale of the existing water system by the present private owner, who is unwilling to do so. Also, the current system has many deficiencies and inadequate information is available regarding the "as-built" system design. While the cost for construction of the project appears to be reasonable, grant administration costs are high for the anticipated level of work. The suggested schedule of implementation is achievable.

Benefit Assessment:

The project will directly benefit the public by providing adequate water supplies in quantity and pressure for the estimated 550 residents in the LaCasa Grande Water and Sewer District. This water supply will also provide improved fire protection and sufficient water to allow landscape irrigation. Improved landscape irrigation is being advocated by health officials to reduce the health hazard associated with lead-contaminated dust, with the lead derived from the nearby lead smelting operation. The proposed project, while important to public health, provides limited benefits to the enhancement, protection, or conservation of renewable resources in the area. Water usage will likely increase after construction of the proposed project. The proposed improvements have good support from the public, local health officials, the fire protection agency and DEQ. The new water system will provide a good, long-term solution to the district's needs for a reliable water supply.

Environmental Evaluation:

The provision of adequate water supplies will allow the propagation of vegetation that will help control the spreading of lead-contaminated dust. While this will serve to protect public health, the application indicated that the lead could be leached into the soils and ultimately into groundwater. This impact was not addressed. Arsenic, another contaminant of potential concern, was not considered in the environmental assessment. Additionally, the provision of adequate water supplies, particularly without metering, may lead to increased water use over the present situation.

Funding Recommendation:

DNRC recommends grant funding of \$100,000, the total amount requested. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws.

The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 50

Applicant Name: City of Missoula
Project Name: Rattlesnake Creek Floodplain Restoration and Control

Amount Requested: \$ 74,000 Grant

Other Funding Sources:

\$ 26,450	Project Sponsor – In-kind
19,000	Project Sponsor - Cash
14,000	Missoula County
10,000	Turner Foundation
5,000	USFWS
13,600	In-kind Volunteer

Estimated Total Project Cost: \$ 162,050

Amount Recommended: \$ 74,000

Project Abstract: (Prepared and submitted by applicant.)

Rattlesnake Creek flows through Greenough Park within the City of Missoula. The park, which was donated to the city by the Greenough family in 1902, has been the center of many debates in recent years. On one side of the debate is the legal mandate for the park to be managed in "its natural state." On the other side is the city's commitment to protecting city residents from the impacts of floods.

The exceptionally high flood years of 1996 and 1997 have brought the issue to the attention of the entire community. The residential neighborhoods and city infrastructure that have been built in the Rattlesnake Creek floodplain during the last 60 years were threatened with severe flooding. The management of Greenough Park as a natural park with natural floodplain dynamics was put in the spotlight as a contributing cause of the flooding. The City of Missoula and the Greenough Park Advisory Committee were put in a position of defending the management of the park without much information on the hydrology or potential compromise solutions to avoid this debate in the future.

With the help of hydrologists, we have formulated a strategy we feel will satisfy all parties involved in this issue. Our plan involves the restoration of a side channel of Rattlesnake Creek that carries much of the high water each spring. This channel is severely eroding and poses a threat to public safety. In addition, we propose to conduct a hydraulic study and, with the information gained from this study, construct a flood control structure along the public/private boundary on the east side of the park (see location map).

Technical Assessment:

Project Background

The project area is on Rattlesnake Creek in the lower reaches of Greenough Park in the City of Missoula. In the spring of 1996 and 1997 high water in Rattlesnake Creek was out of its banks and

flowing through a heavily used parking lot and lawn area of Greenough Park. The area was essentially unusable for nearly six weeks. In addition, the basement of at least 1 private residence along Monroe Street was inundated and at least 12 additional homes were protected by sandbag dikes. Because the city manages Greenough Park in a natural state, the parks and recreation department received substantial public criticism and blame for the extent of the flooding. It was common perception that, if the city had taken a more active role in maintaining channel capacity and removing downed trees and other debris, the flooding would have been less severe.

Technical Approach:

The goal of this project is to provide for conditions in Greenough Park, which will allow Rattlesnake Creek to meander naturally within the park, while providing some level of protection against catastrophic flooding. To accomplish this goal, the applicant proposes to restore the existing side channel to the creek, which is now actively eroding. The length of creek to be restored is approximately 1,000 feet. The applicant also proposes to conduct a hydraulic study to determine the most cost-effective flood control structure for the eastern boundary of the park. This hydraulic study will consist of a topographic survey, flood flow modeling, and engineered designs for the flood control structure. The structure will be constructed of concrete and will be approved by a licensed engineer. The hydraulic modeling will provide necessary data for structure design and for county floodplain permitting. Through the permitting process, input will be sought from DFWP, U.S. Army Corps of Engineers, and NRCS. It is estimated that the project will take 15 weeks. However, several reviewers thought this schedule may be overly ambitious.

The problem is not very well defined. There was little discussion of what problems the flooding caused, and no dollar figure of damage associated with the flooding. It appears that nuisance flooding has occurred primarily due to parking lots and buildings located in the floodplain. It would be useful to know if the problem is caused entirely by a natural progression of fluvial processes or if there are other contributing factors. It would also be helpful to know if upstream floodplain development has significantly modified the downstream hydrology (peak-flow hydrograph) and sediment budget (supply of coarse sediment) of Rattlesnake Creek. If these are significant causative factors, then the proposed solution may not be as effective as hoped and some amount of long-term channel maintenance may be necessary.

Project Management:

A paid hydrologist and fluvial geomorphologist consultant will be one of three individuals on the project management team. The other two-team members are the city landscape architect and city arborist. The consultant will have the primary responsibility for daily project management. Public participation will be a major part of this project. City personnel will provide ample opportunity for interested individuals and groups to influence the design and construction activities for the proposed work.

Financial Assessment:

RRGL Grant Costs

Professional / Technical	\$29,000
Contingency	4,5000
Construction	40,500
Total Grant Costs	\$74,000

Estimated Total Project Costs \$162,050 RRGL Grant Share = 46%

Cost estimates for project design and management on construction appears reasonable. Cost estimates for actual construction work are difficult to estimate given the lack of a specific design--however given the scale of the channel involved, the budget may be inadequate. This does depend on the type of structure chosen. There does not appear to be any overspending.

Benefit Assessment:

The project serves multiple uses; it will provide flood protection and recreation for the city of Missoula and water quality improvement for the Clark Fork basin. The city park receives heavy use by the citizens of Missoula, but there is no documentation of citizen support. Benefits will be measurable because of the decrease in flood damage. The project will result in quantifiable benefits to a renewable resource through improvements in resource conservation.

The project results in quantifiable benefits to a renewable resource through improvements in resource conservation. The project directly results in the protection of renewable resources, such as water and wildlife, through water quality improvement. The project helps manage renewable resources to provide for future benefits to Montanans.

Environmental Evaluation:

This project will result in typical construction related short-term adverse environmental impacts that cannot be entirely avoided in any construction project. Construction impacts must be identified and mitigated to the extent possible. No long-term adverse environmental impacts are anticipated.

Funding Recommendation:

DNRC recommends grant funding of \$74,000, the total amount requested. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 51

Applicant Name: Town of Eureka
Project Name: Water System Facility Plan

Amount Requested: \$ 35,000 Grant

Estimated Total Project Cost: \$35,000

Amount Recommended: \$25,000

Project Abstract: (Prepared and submitted by applicant.)

Eureka's water system consists of a 500,000-gallon steel reservoir, 1-inch to 12-inch water mains,

and two shallow infiltration galleries. Water mains are primarily cast iron and asbestos cement; the smaller mains are galvanized. The majority of the mains were installed prior to 1972. In 1972, the storage tank, infiltration gallery, and major loops were installed.

The system has serious deficiencies in supply and distribution. Supply is two infiltration galleries. Each is approximately 18 feet deep. Disinfection is provided. During peak use periods, one pump operates 17 to 21 hours. On occasion, the second pump is needed to maintain water in the tank. Production appears to be very high, indicating a serious leakage problem. DEQ evaluated the supply in 1998 as groundwater under the influence of surface water.

Many services are galvanized iron, which is susceptible to electrolyte corrosion and, thence, leakage. Many services do not have curb stops and few services have meters. The town has not had a leak survey. Based on production, there are leakage problems.

An area west of town limits wishes to connect. There is no or little information to assess the impact of approximately 120 new users. Flows and pressure today are marginally acceptable in areas and unacceptable during peak instantaneous demands, such as a fire.

Eureka has no comprehensive plan establishing needs and priorities for water system improvements. A water facility plan would identify specific deficiencies, evaluate alternative solutions, recommend a solution, and provide cost estimates, a financial plan, and implementation schedule. Completing the plan will enable the town council to correct the deficiencies without being forced to respond in crisis management.

Technical Assessment:

Project Background:

In 1995, DEQ conducted an annual inspection that identified numerous problems and needs associated with the water system. In May of 1998, DEQ notified the town that the water supply was determined to be groundwater under the influence of surface water. These two instances along with suspected leakage problems have prompted the town to realize the need to prepare a water system facility plan.

Technical Approach:

The goal of the project is to prepare a comprehensive plan identifying needs and deficiencies in the water system, solutions, cost of correction, and an implementation strategy. The applicant has provided a listing of tasks required completing the plan along with a draft outline of the document. The proposed objectives appear quantifiable and attainable.

The only alternatives to preparing a facility plan at this time are to do nothing or to proceed with improvements without necessarily having identified the best alternative. A comprehensive facility plan with alternatives and recommended solutions to identified problems is the best alternative for the town. The community anticipates implementing recommendations resulting from the water facility plan.

The only question left unanswered by the applicant is whether or not any exploratory drilling or detailed hydrogeological studies will be a part of the water facility plan. Neither the general outline nor the man-hour summaries are specific on this issue. Since a new or improved water supply is a very integral part of the plan, lack of effort in this area may leave the community with a plan that

does not provide all of the answers to a most important question.

Project Management:

The project sponsor will administer the grant and provide necessary paperwork to DNRC. The selected consultant will provide monthly and quarterly reports to the town and DNRC. A man-hour estimate, which was included rather than a project schedule, appears realistic. The project, by its nature, is rather simplistic and should not require exhaustive management efforts.

Financial Assessment:

RRGL Grant Costs

Contracted services \$35,000

Total Grant Costs \$35,000

Estimated Total Project Costs \$35,000 RRGL Grant Share 100%

The project budget indicates \$2,000 of in-kind town monies will be allocated toward contract administration of the project. No out-of-pocket match funds are proposed, and as such, the existing monthly water user rate of \$14.68 will remain the same. The town appears to be relying solely on this grant to fund the water facility plan. The application provides a man-hour estimate for particular elements of the project. The documentation for arrival of costs appears adequate. The budget narrative notes that \$3,500 of the \$35,000 cost for the facility plan is to go toward leak detection services. The proposed cost of \$35,000 for the facility plan appears rather high for the scope of services laid out in the application.

Benefit Assessment:

The application states that the facility plan will likely recommend installation of water meters, thus resulting in resource conservation and improved water-use efficiency. The anticipated improvements to the water supply will enable the community to develop and better manage a renewable resource, which will benefit the residents of the community as well as the surrounding area. The facility plan may determine that improvements will allow nearby Midvale (120 users) to hook onto the Eureka system. The project will serve an identifiable public interest by enabling the community to have a safe, reliable water system that will be ongoing.

Environmental Evaluation:

Since the proposed project involves preparation of a water facility plan, environmental impacts are not anticipated at this stage.

Funding Recommendation:

DNRC recommends a grant of \$25,000. The requested amount of \$35,000 appears quite high for the proposed scope of services outlined in the application. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. A detailed hydro-geological analysis will be included in the project scope of work. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall

implement all applicable BMPs in the design and construction/execution of this project.

Project No. 52

Applicant Name: City of Havre
Project Name: Source-Water Delineation and Demonstration for Havre and Seeley Lake

Amount Requested: \$100,000

Other Funding Sources: \$4,625 Project Sponsor
1,350 Seeley Lake Water District
35,145 MBMG

Estimated Total Project Cost: \$141,120

Amount Recommended: \$20,000

Project Abstract: (Prepared and submitted by applicant.)

The Safe Drinking Water Act amendments of 1996 require that states develop and implement source-water assessment programs for public drinking water supplies. Because watersheds in Montana vary widely in complexity, demonstration sites are needed to provide guidance for communities or their consultants, technical assistance providers, and others performing source-water protection area delineations. Under this proposal, MBMG will perform source water area delineations for the communities of Havre and Seeley Lake. These delineations will become part of the Source Water Protection Technical Guidance Manual, which is currently being completed by MBMG and DEQ. Havre is located on the plains east of the Rocky Mountains in north-central Montana and draws water from the Milk River. Water quality degradation has nearly tripled chemical costs for the Havre system in the past few years. The community of Seeley Lake, located in an intermontane valley in western Montana, draws water from Seeley Lake. Rapid population growth in the area and the proliferation of septic tanks threatens the water quality of the lake. Since the two demonstration sites vary widely in hydrologic setting, they will be representative of many other sites and will serve as examples for others in delineating their own source-water protection areas. The life of the project is expected to be 24 months.

Technical Assessment:

Project Background:

Havre's drinking water source is located in the Milk River Basin within the Northwestern Glaciated Plains Ecoregion of Montana. Seeley Lake's water supply is in the mountainous Northern Rockies Ecoregion. These two study areas were chosen to be demonstration sites for source-water delineation studies because of their vastly different hydrologic settings and because MBMG has ongoing studies in those watersheds.

The Safe Drinking Water Act (SDWA) Amendments of 1996 require that all communities in Montana eventually conduct similar watershed delineations. The results of the work proposed in this application would be appended to the *Source Water Technical Guidance Manual* that is currently being written by MBMG for DEQ, as Part 3, "Surface Water Demonstration Site Delineations."

EPA has provided \$1.4 million to complete this process for every public water supply source in the state. There are approximately 1,900 public water supplies utilizing approximately 3,500 water sources in the state. DEQ's experience indicates that generally \$5,000 to \$10,000 is adequate to complete the delineation for each water supply. Furthermore, EPA has mandated completion of the delineations by the year 2002. The applicant has proposed to spend \$141,000 to complete the delineation for two water supplies, and the study on these two systems will not be completed until the year 2000.

Technical Approach:

Although the need for this project is fairly well described in the application, both in terms of legal requirements and threats and problems that exist to the water supplies of both towns, details of the actual project study plan were not well developed or explained. This made evaluation of the technical approach difficult. For example, the applicant states that time-of-travel studies will be conducted, but does not state why this work is needed, or where, when, and how often these studies will be conducted. Nor were estimates provided regarding the numbers of water quality or stream gauging stations at either study area.

Key statements in the project implementation plan were often too vague to evaluate, for example "ponds, lakes, springs, surface water diversions, and known discharge sites will be inventoried and quantified in so far as possible," and "citizen committees will be formed...to conduct the necessary inventories that are part of the source water protection process." No specific examples are provided regarding the kinds of data that the citizen committees would collect. In another instance, the applicant states that "data from two existing projects on Sage Creek (one of which is funded by the DNRC RRGL program) will also augment the delineation for Havre." Nothing is further stated about the kind of data being collected during these existing studies, exactly how the data will augment the proposed work, or what measures will be taken to prevent duplication of efforts among the studies.

Appropriate scale maps of the proposed study areas were not provided. Maps showing the locations of the existing studies in relation to the specific work proposed in this application would have been helpful in clarifying whether work will actually be conducted in the entire Milk River watershed upstream of Havre (as shown on the application map), or primarily in Big Sandy and/or Sage creeks.

Project Management:

The water plant supervisor for the City of Havre and the general manager for the Seeley Lake Water District will manage the project. The amount of time that each would provide to the project was not directly presented in the application. However, \$4,220 is budgeted for their salaries (\$1,720 from this grant and \$2,500 of in-kind services). No hourly rates were shown for the project administrators, but if we assume that they make \$10/hr, approximately 442 hours would be available to administer this grant. This would mean that during the 24-month life of the project, less than 10 hours per month would be devoted to administration at Havre and Seeley Lake.

Financial Assessment:

RRGL Grant Costs

Administration	\$ 2,472
Professional	64,515
Technical	27,734

Equipment	5,279
Total Grant Costs	\$ 100,00
Estimated Total Project Costs	\$ 141,120 RRGL Share = 71%

The administration costs are salary and benefits for the water plant supervisor for the City of Havre. Professional costs are salaries and benefits for an MBMG hydrogeologist, technician, and students (\$57,510) and for travel (\$7,005). Technical costs are primarily for laboratory analyses that would be conducted at MBMG (\$14,790) and at a private laboratory (\$2,600). An additional \$6,886 is allocated for travel, and \$3,208 for supplies and printing. No equipment would be purchased, but \$5,279 would be paid to MBMG for equipment rental. In summary, \$94,928 would go to MBMG, \$2,600 to a private laboratory, and \$2,472 to the City of Havre. The technical approach for this project was not adequately developed, nor was the budget sufficiently developed to determine whether it truly reflects project costs.

In-kind and matching dollars include \$13,763 from MBMG for the salary and benefits of another hydrogeologist and \$21,382 of indirect costs for MBMG. Indirect costs amount to 30% of the salaries and benefits that would be paid by this grant (\$57,510) and by MBMG (\$13,763). A total of \$3,375 of in-kind services would be contributed by Seeley Lake and Havre.

Benefit Assessment:

This study would provide quantifiable direction for improvements in the conservation, protection, and management of two public drinking water sources. This work should result in measurable benefits to the public served by these sources, by identifying and quantifying contamination sources. It would also contribute to ongoing programs at both communities to protect or improve the quality of their water supplies. There is documented citizen support for this work. Also, there is an identified public interest for this project. Everyone who depends on public supplies for their clean drinking water, especially in Seeley Lake and Havre, would benefit from the project. This study would benefit Montanans statewide, since the results would be published as a "how-to" manual for delineating other surface water protection areas.

Environmental Evaluation:

This project does not have any long-term environmental impacts nor any potential adverse impacts.

Funding Recommendation:

DNRC recommends grant funding of \$20,000 which would provide \$10,000 to complete each of the source delineations. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget, and after all matching funds have been secured. A detailed hydrogeological analysis will be included in the project scope of work. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

Project No. 53

Applicant Name: City of Troy
Project Name: Water System Master Plan

Amount Requested: \$ 23,646 Grant

Other Funding Sources: \$ 6,354 Local Funding

Estimated Total Project Cost: \$ 30,000

Amount Recommended: \$ 23,646

Project Abstract: (Prepared and submitted by applicant.)

Troy's water system consists of a 125,000-gallon steel reservoir, 2-inch to 8-inch water mains, and two deep wells. Water mains are primarily cast iron, a few wood, some plastic, and the smaller sizes, galvanized. The majority of the mains were installed prior to the 1950s. There have been no improvements since the 1970s when the creek source was abandoned and the old St. Regis well added.

The system has serious deficiencies. Production appears to be very high (there are no meters on the wells), indicating a serious leakage problem. DEQ evaluated the supply in 1994 and noted the need to focus on leak correction.

Many services are galvanized iron, which is susceptible to electrolyte corrosion and, thence, leakage. There are few curb stops and no meters. There are no records of service locations or valve or main locations.

The 125,000-gallon storage tank is small. Additional storage is needed. Controls malfunction frequently, resulting in the tank draining.

Troy has no comprehensive plan establishing needs and priorities for water system improvements. A water facility plan would identify specific deficiencies, evaluate alternative solutions, recommend a solution, and provide cost estimates, a financial plan, and implementation schedule. Completing the plan will enable the council to correct the deficiencies without being forced to respond in crisis management.

Technical Assessment:

Project Background:

During DEQ's 1994 annual water system inspection in Troy, the following problems were noted: (1) the storage tank needs fencing; (2) a second tank is needed; (3) a leak detection survey is necessary, with repair of identified leaks; (4) a fire flow analysis is required; (5) a wellhead protection plan is necessary; and (6) Well 2 is potentially subject to industrial contamination. Other problems in the public water system include a draining water tank and no meters. At this time, the water tank has been inspected and the wellhead protection plan is being prepared by Montana Rural Water. Now the City of Troy would like to investigate and solve its other water system problems.

Technical Approach:

The goal of the water system master plan is to identify water system needs and deficiencies, alternative solutions, costs of correction, and an implementation strategy for the City of Troy. When completed, the master plan will provide a guide for improving the water system to meet current and anticipated future standards. Preparation of a master plan is the best first step toward upgrading the City of Troy's public water system. As part of the water system master plan process, the public will be educated as to its water system problems and needs and its input will be solicited. It is expected that as a result of the master plan document, a rate increase can be implemented and actual water system improvements can be completed. A fire flow analysis and leak survey will be performed as part of the master plan services.

Only a general scope of services and brief outline of the proposed master plan document were provided by the applicant. Few details specific to the Troy water system were included. Because of this lack of detail, the quality and usefulness of the final document are unknown.

Project Management:

The project management team will consist of the mayor, clerk, public works director, and consultant. The mayor will provide overall project management. The clerk will be responsible for financial records, correspondence, and documentation. The public works director will assist the consultant in data acquisition and site investigation, with the consultant responsible for actual completion of the project facility plan. The consultant will provide monthly and quarterly progress reports to the city and DNRC. As part of the planning process, two or three public meetings will be held to solicit comments and project direction. A water user survey will also be completed.

Financial Assessment:

RRGL Grant Costs

Contracted Engineering Services \$23,646

Total Grant Costs \$23,646

Estimated Total Project Costs \$30,000 RRGL Grant Share = 79%

The \$30,000.00 project cost includes 320 consultant-hours at \$82.81 per hour and \$3,500 for a leak survey. While it is difficult to predict the exact number of hours necessary to complete each individual section of the water system master plan, the total allocated 320 hours seem adequate to complete the study. No specific costs were designated in the budget for office costs. However, the City of Troy has indicated that it will provide 80 man-hours from the clerk and public works director outside of the \$30,000 project cost. At \$40.00 per hour for labor costs, this estimated in-house contribution is \$3,200.00.

The city proposes to raise its \$6,354.00 project contribution through a \$0.50 user fee increase for the one-year period following the DNRC grant award. Spending on the water system master plan will not occur until the DNRC grant is awarded.

Benefit Assessment:

The proposed water system master plan is the first step toward implementing water system

improvements. The leak study conducted as part of the master plan will help in prioritizing main replacement and repair which will help in conservation of the water supply. The evaluation of user characteristics in the study will assist the City of Troy in establishing a future metered rate which will also promote water conservation.

The 2,648 citizens of Troy will directly benefit from the master plan study, both now and in the future. The study will educate the water users about the water supply, storage, and distribution problems that exist within their community. The discussion and cost-comparison of the various improvement alternatives presented in the master plan will allow the town to select the improvements they feel are most important. Absent the identification problems with the water system facilities, it is unclear whether the project will measurably improve renewable resource conservation, management, or development.

Environmental Evaluation:

Since the full scope of this proposed project is completion of a water plan master plan, with no construction, there will be no adverse environmental or potential adverse impacts from this project.

Funding Recommendation:

DNRC recommends grant funding of \$23,646, the total amount requested. Grant funds for the project will be provided after DNRC approves the project scope of work, administration, and budget. The project sponsor shall conduct all activities associated with this project in accordance with all applicable state and federal regulations and laws. The project sponsor shall implement all applicable BMPs in the design and construction/execution of this project.

The following projects, listed alphabetically, are not recommended to receive grant or loan funding.

Applicant Name: City of East Helena
Project Name: Wastewater Treatment Facility Improvements

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 479,609 TSEP Grant
379,609 SRF Loan

Estimated Total Project Cost: \$ 959,218

Amount Recommended: No Funding Recommended

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - The East Helena Wastewater Treatment Facility is an aerated lagoon complex, providing secondary treatment. The present facility was completed in 1982 replacing a two-cell facultative facility. Since its construction in 1982, the facility has operated satisfactorily and has a good history of meeting Montana Pollution Discharge Elimination System (MPDES) requirements under normal operations.

Problem - In 1996, East Helena's MPDES permit expired. To protect the quality of Prickly Pear

Creek, the new permit stipulated much tighter effluent standards. Requirements of the new permit involved more stringent limits for fecal coliform and residual chlorine, as well as limits on acute toxicity (metals and ammonia) that the former permit did not contain.

The existing system cannot reliably meet the new requirements without modifications. Without improvements to the facility, environmental degradation of an I-Class stream will continue, along with both community-wide public safety and health risks.

Proposed Solution - The Phase I improvements are:

- Lift station rehabilitation and flow metering improvements;
- New portable generator, upside pumps, and wetwell (Montana Avenue lift station);
- Repair and upgrade of inter-cell piping and valves;
- Sludge removal (all three cells);
- Hypalon liner repair (all three cells);
- New telemetry and control system; and
- Aerator upgrade (draft tubes with existing blowers / Cell 3).

It is anticipated that once these improvements are implemented, performance of the existing treatment process, including nitrification, will be maximized. Improvement performance will have beneficial effect of preventing adverse environmental impacts on Prickly Pear Creek.

The liner repair will also eliminate the present potential of wastewater percolating to groundwater. More effective disinfection will have the beneficial effect of ensuring reliable bacterial kill prior to discharge of effluent to the stream. Limiting chlorine residual has the beneficial effect of preventing adverse impact to the receiving stream's biota from excess disinfectant.

Technical Assessment:

Project Background:

The East Helena wastewater treatment lagoon is a three-cell, aerated lagoon with disinfection and discharge to Prickly Pear Creek. The receiving water is classified "I" or impaired in the section where discharge occurs. In order to meet the goals of Montana Water Quality Standards, East Helena's re-issued MPDES permit included more stringent limitations for fecal coliforms, chlorine residual, and acute toxicity in the discharge. In order for the facility to meet the new limitations, improvements to address disinfection as well as ammonia and metals removal are necessary. In December 1997, the community and its consulting engineer completed a wastewater facility master-planning document that identifies system needs and provides recommended alternatives to satisfy those needs.

Technical Approach:

The selected alternatives are to enhance the existing treatment lagoon through repair of the failed lining, sludge removal, repair of inter-pond piping, installing a new electronic control system, and upgrading a portion of the existing aeration system. Also included in the project scope are repairs to the facility's influent lift station, upgrades to its flow monitoring, and upgrades to a collection system lift station.

The city's engineer contends that the proposed improvements, in conjunction with the city's industrial pretreatment program, will result in more complete nitrification of ammonia in the effluent

and thus, reduced ammonia toxicity in the discharge. Influent copper, lead, and zinc are thought to be inhibiting nitrification and the pretreatment program is expected to reduce influent metals concentrations. If the facility is allowed to nitrify as a result of these improvements, reduced ammonia levels may also have beneficial results on the facility's ability to disinfect. It is thought that the chlorine used for disinfection is reacting with effluent ammonia to form chloramines, rather than providing free chlorine for adequate pathogen kill.

Final effluent limitations for toxicity, fecal coliforms, and chlorine residual become effective July 2000. While it is likely that the proposed project will improve the treatment capabilities of East Helena's facility, the application fails to demonstrate whether the improvements will be sufficient to meet the pending MPDES limitations. The applicant intends to implement proposed improvements and gauge their effectiveness in addressing toxicity, fecal coliform, and residual chlorine problems. At that point, the city will assess its compliance with the MPDES permit and determine whether further improvements are necessary.

There is a concern that the proposed improvements may not result in compliance with the final MPDES limitations, since there are no improvements that directly address disinfection or ammonia removal. The improvements are expected to enhance the system's ability to convert ammonia to nitrate, which could have a beneficial effect on its ability to disinfect. However, data from similar lagoon facilities across Montana show that ammonia removal during colder periods of the year is severely impaired.

Project Management:

The city has contracted with a grant-management consultant to function as primary grant administrator in conjunction with the city's own secretarial staff. Level of effort and cost appears sufficient to manage a project with three funding sources. Coordination between DOC, DNRC, and DEQ and timing of each funding component has been considered in formulating project schedule. Public is invited to all council meetings, although there is no discussion of notifying the public about what is to be discussed at each meeting. All consultants are expected to provide status reports at regularly scheduled council meetings in order to effectively track consultants' performance. A formalized project implementation plan will be used as primary device for gauging progress. A copy of this plan is included in the application.

Financial Assessment:

RRGL Grant Costs

Professional Services	\$ 1,922
Legal Costs	550
Construction Inspection	5,802
Construction	84,473
Construction Contingencies	7,253
Total Grant Costs	\$ 100,000

Estimated Total Project Costs \$ 959,218 RRGL Grant Share = 10%

The estimated \$959,218 project is to be funded with TSEP and DNRC grants; and a \$392,189 SRF loan. Rates are expected to remain the same at \$14.70/user month since the city is retiring its series 1985 debt in 1999. Debt service (\$5.12) on existing debt to be directed to debt service on

new SRF Loan (\$4.16) plus building reserve account. Funding applications are pending, and the city has submitted pre-application information to DEQ, and is on the state project priority list.

Activity costs (\$917,426) do not agree with the project cost estimates presented in Appendix E of the application or in the engineering report. The project budget may need to be increased by \$41,792 to include program costs. The city has expended \$114,800 for preliminary engineering, wastewater and sludge sampling, grant application preparation, and activities related to its new MPDES discharge permit. Of that, \$86,600 is directly related to the wastewater improvement project. All of the anticipated RRGL funds will be used for grant management, auditing, construction and inspection that will take place during the 1999 season and later. The sponsor will conduct project in coordination with RRGL until funds are available in 1999.

Benefit Assessment:

Meeting MPDES permit limitations will assist in enhancing the quality of an impacted (Class I) stream. However, MPDES permit compliance is uncertain with implementation of the recommended improvements. If successful, the project would qualify as resource conservation and protection since it seeks to improve the water quality/quantity of Prickly Pear Creek. Enhancing the quality of a Class I stream to a point where it can be considered a "high quality" stream will provide future benefits to Montanans. The goal of the project is to reduce/eliminate the high concentrations of ammonia in the discharge and also the occurrence of instream toxicity and level of coliform bacteria. If successful, this would have measurable public health benefits. The application did not provide adequate information to conclude that adequate ammonia removal would result. Consequently, it is unclear whether the proposed project will achieve measurable improvements in water quality.

Environmental Evaluation:

The environmental evaluation is thorough and complete. No long-term, adverse impacts were noted, although short-term, construction-related impacts are unavoidable. Overall environmental impacts will likely to be beneficial. However, if the system still fails to meet the requirements of the MPDES permit, ongoing degradation to Prickly Pear Creek would occur as a result of this project.

Funding Recommendation:

DNRC recommends no funding at this time since the applicant has failed to demonstrate whether the project proposal will result in a system that complies with the requirements of the city's MPDES permit.

Applicant Name: Homestead Acres County Water and Sewer District
Project Name: Water System Improvements

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 168,000 TSEP Grant
 113,400 CDBG Grant
 50,000 Reserve Funds

Estimated Total Project Cost: \$ 431,400

Amount Recommended: No Funding Recommended

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - The district's water system was constructed in 1979 to provide water for 490 potential services. The water system currently supplies water to about 152 residential services. The funding for the original system was provided by \$750,000 in bonds.

Problem -The following problems and deficiencies have been identified:

1. The system is deteriorating from corrosion because of its age.
2. There is insufficient water volume to supply the district's demands because one of the supply wells and two of the storage reservoirs are inoperable.
3. Significant pressure fluctuations occur in the system, resulting in dangerously high pressures at users' homes or else not enough pressure to supply water throughout the system.
4. The inoperable well provides poor quality water.
5. Excess chlorination due to non-looping water mains results in undesirable water taste and production of dangerous trihalomethanes.

Proposed Solution - The proposed project will install a new water supply well, a pressure reducing station, and approximately 5,100 feet of new distribution main.

Technical Assessment:

Project Background:

The proposed project consists of improvements to the public water supply and distribution system for the Homestead Acres Water and Sewer District. Homestead Acres is a residential development located approximately four miles north of Great Falls. The water system was originally constructed in 1979 and is comprised of three water supply wells, three storage reservoirs, and approximately 18 miles of distribution mains. The water supply is disinfected using an in-line gas chlorination system.

The present water supply system currently uses only wells 1 and 3. Use of Well 2 was discontinued due to poor water quality. Using only two wells, the district is unable to supply sufficient amounts of water to meet user demands during the summer months. Due to recent maintenance problems with the remaining wells related to corrosion, the district is questioning the overall reliability of their water source. The existing water supply is not in compliance with current DEQ design standards. Distribution system deficiencies include both inadequate and extremely high pressures. The deficiencies are attributed to a large number of dead-end water mains and a malfunctioning pressure reducing valve. Dead-end water mains in the system require the use of excessive amounts of chlorine to achieve acceptable residuals levels. As a result, users near the chlorination facility are forced to use water with high concentrations of chlorine. The existing water distribution system is not in compliance with current DEQ design standards.

Technical Approach:

The goals of this project are to improve and enhance the reliability of the district's water supply and to remedy the water distribution problems. The replacement of Well 2 with a new well will eliminate the district's water supply problem without sacrificing water quality. This new well will also provide water for additional growth in the community. Deficiencies in the water system will be corrected by the installation of approximately 5,100 lineal feet of water main connecting dead end lines to create a looped system. The pressure-reducing valve will also be replaced allowing for better control of system pressures.

The proposed project will be completed in two phases. Phase I will consist of the design of a new supply well, pressure reducing valve station water main improvements, completion of a capital improvements plan, and cultural resource survey. Phase II is the construction phase of this project and represents the majority of the project costs (\$404,800). Phase II is expected to begin toward the end of the year 2000 and be completed the earlier part of 2003.

While the plan identifies potentially appropriate solutions, only a cursory level of alternative development and comparison of alternatives was presented. The recommended approach proposed for improvements to the distribution system is not the most appropriate solution to the district's needs at this time. The preliminary engineering report submitted with the application stated that the looped system would not have a dramatic effect on system operation until the system approaches full capacity, or 490 residences. The district currently serves 152 residences. The application fails to demonstrate that the selected alternative will remedy the problems identified in the application in the near term.

Project Management:

This project will be managed by the water users board president and secretary. The management team will be supported by legal counsel, an accountant, consulting engineer, and grant administrator. The district has recognized the importance of planning and has included costs for a capital improvements plan in the 1998 TSEP and RRGL grant applications.

The district appears to have adequate resources to maintain the system and comply with regulatory requirements after the improvements have been made.

Financial Assessment:

RRGL Grant Costs

Legal/ Audit Fees	\$ 3,850
Construction	80,450
Engineering Design/Inspection	3,400
Contingency	8,050
Surveying/Permitting	4,250

Total Grant Costs \$ 100,000

Estimated Total Project Costs \$ 431,400 RRGL Grant Share 23%

The estimated cost for this project, including administration and a contingency, is \$431,400. The district has also applied for a TSEP grant (\$168,000) and has dedicated \$50,000 of its own money

to this project. Next year the district will apply for a CDBG grant (\$113,400).

The current average monthly user rate is \$79.72, or about 200% above the target rate established by DOC. Assuming the district is 100% successful in securing the TSEP, RRGL, and CDBG grants, the average monthly user rate is anticipated to drop by \$25.94 for a new rate of \$53.78. This drop in the average monthly rate is attributed to a decrease in operation and maintenance costs as well as an increase in population anticipated between now and the completion of the project (2003).

Benefit Assessment:

Benefits to resource conservation and enhancement will be negligible as a result of this project. While the project will benefit the citizens of the water district, the resource benefits ascribed to the project are realized only through the development of an additional water source. The improvements to the distribution system will not result in any benefits to resource conservation or enhancement.

This project will improve the water supply for a water system serving 152 existing residences (a total of 490 potential future residences). The new water supply well will provide water of good quality in quantities that will meet future demands. Water distribution improvements will improve delivery of water to customers, eliminate stagnant water at the end of dead-end mains, and improve system pressures. These benefits will not be seen until the district approaches full capacity.

Environmental Evaluation:

The Montana Historical Society noted that there is one previously recorded historic site (a historic farmstead) in the area. The impact of this project on the area is unknown. If impacts are expected, they should be mitigated in accordance with the Montana Historical Society recommendations.

This project will produce some short-term adverse environmental impacts that are normally associated with construction activities. Impacts include dust, water quality impacts and erosion control, noise, loss of vegetation, encroachment of noxious weeds, etc. Most of these short-term adverse impacts can be minimized with commonly used mitigation measures.

Funding Recommendation:

DNRC recommends no funding. The selected alternative will not resolve the current problem of excess and insufficient system pressure until the system reaches full capacity at 490 residences. The system currently services 152 residences. Without knowing if or when full capacity will be reached, the selected alternatives does not present the best course of action.

Applicant Name: Lake County
Project Name: Class I Airshed Protection

Amount Requested: \$83,470

Other Funding Sources: \$165,421 Project Sponsor

Estimated Total Project Cost: \$248,891

Amount Recommended: No Funding Recommended

Project Abstract: (Prepared and submitted by applicant.)

Air quality is important, especially to Montanans. It is necessary for water quality, crop production, and livestock, and irreplaceable for human health. EPA has designated the Flathead Reservation as a Class I Airshed, permitting very small increases in existing ambient concentration. Tribal Air Quality has collected data in Lake County's population centers on total suspended particulate, and particulate matter smaller than 10 micrograms in size as quality measurements to remain Class I. According to data collected, EPA classified Ronan as Group One, meaning air quality is expected to exceed EPA standards. This quality is now monitored on a 24-hour basis.

Epidemiological studies show particulate air pollution exacerbates illness, such as respiratory disease. It increases the number of deaths from cardiovascular and respiratory diseases. Respiratory disorders account for the greatest number of hospital cases for the Flathead Service Unit, and acute respiratory infection is five times the national rate.

Water quality is jeopardized by atmospheric dust, shown by biological research to account for 30% of the total sediment load in surface water and a major source of nutrient loading, both phosphorous and nitrogen.

Air quality in Lake County can be marginal (meaning particulate levels are close to, or occasionally exceed the standard) for two principal reasons. The first is refuse and home heating fuel burning; second is a high number of unpaved roads supporting a mobile population.

Paving four miles of road upwind of Ronan will eliminate the contribution of particulates to in-bound air over the Group One area, directly benefiting 5,230 people and 20,000 people indirectly. Broad-based support for the project from groups and individuals is overwhelming.

Because a basic road structure already exists, environmental impact on the area, other than accomplishing positive objectives, will be zero to light.

Technical Assessment:

Project Background:

This project is located in Lake County, one to two miles south and southwest of the City of Ronan on the Flathead Indian Reservation. EPA has designated the reservation as a Class I airshed. The Ronan area has been further placed in group One status, which means that air quality often exceeds Class I standards. The second-leading cause of air quality problems in the project area is dust from unpaved roads. The applicant proposes to pave four miles of heavily used roads upwind from Ronan to help achieve compliance with the Class I designation.

Technical Approach:

The applicant provided sufficient documentation that air quality problems are a real concern in the project area, and that paving roads can certainly help alleviate this problem. However, no site-specific data were presented regarding contaminant levels in the Ronan airshed. Area-wide air quality problems are discussed in some detail, but air quality data for Ronan were not provided.

The applicant did not attempt to estimate the potential reduction in suspended particulate matter that might be expected in the 14-square-mile airshed around Ronan as a result of this project. Pre-project air quality levels are not discussed, let alone any projections of improvements in air quality levels that might occur as a result of this project. Furthermore, no post-project air quality-monitoring plan is proposed to evaluate the effectiveness of the proposed action.

In the alternative section of the application, dust suppression using dust oil or magnesium chloride was said to provide only "limited dust abatement." However, according to Pat Driscoll of DEQ, these suppressants, if properly applied, can reduce dust levels by more than 85%. Also, in a telephone conversation with the applicant, it was revealed that Lake County has never actually applied dust suppressants to the roads proposed for paving.

Project Management:

This project would be coordinated through the Lake County Commissioner's Office and implemented by Bob Smith, the Lake County road supervisor. All budgeting and finances would be administered by the Lake County finance officer, Maureen Sweeny. Lake County would provide \$4,725 of in-kind services to administer the project, which includes 50 hours of Ms. Sweeny's time.

Financial Assessment:

RRGL Grant Costs

Construction	\$ 83,470
Total Grant Costs	\$ 83,470
Estimated Total Project Costs	\$ 248,89

RRGL Grant Share = 34%

The requested grant dollars would be used totally for construction costs associated with placing double bituminous pavement ("chip seal") on four miles of road. This was the alternative chosen by the applicant, primarily because it is estimated to cost only \$62,000 per mile versus \$125,000 per mile for plant mix bituminous pavement. According to Tim Olson of Montana Department of Transportation, the price estimate for the latter, more permanent paving method appears to be a little high. Mr. Olson estimated the per mile cost for a plant mix road to be closer to \$90,000 per mile. Unfortunately, he was not able to provide an estimate for the proposed double bituminous paving, since his department doesn't have experience with that type of road system.

The applicant estimates that the proposed chip sealing would last about seven years before needing to be replaced. This equates to \$248,891 (the total project cost) divided by seven years = \$35,556 per year to achieve dust control on these roads. The application states that it would cost approximately \$3,600 per year to apply dust suppressants to the same roads. Since dust suppressants could control at least 85% of the particulate problems, it is hard to justify spending ten

times as much money (\$35,566/yr. vs. \$3,600/yr.) to achieve, at most, another 15% reduction in suspended particulate levels.

Benefit Assessment:

There is an identifiable public interest and documented citizen support for any projects that would improve the air quality in Lake County. This project would also help implement an ongoing program in support of a renewable resource, the air.

However, any improvements in the conservation, protection, and management of the air would not be clearly quantified after the project's completion. No public involvement is planned prior to project implementation. There would be no statewide benefits from this project.

Environmental Evaluation:

This project would not have any long-term environmental impacts nor any potential adverse impacts.

Funding Recommendation:

DNRC recommends no funding. The application fails to quantify the degradation in air quality that results from the road's contribution to suspended particulates in the airshed. Without this information, it is impossible to determine whether the project would result in significant improvements to Ronan's airshed. Furthermore, the cost of the selected alternative is excessive in comparison to the cost and effectiveness of the application of dust suppressants for abating suspended particulates in the area.

Applicant Name: City of Livingston

Project Name: Yellowstone Street to Main Street Ditch Improvement

Amount Requested: \$64,000 Grant

Other Funding Sources: \$16,000 Livingston Ditch Users Assoc.

Estimated Total Project Cost: \$80,000

Amount Recommended: No funding recommended

Project Abstract: (Prepared and submitted by applicant.)

The Livingston Ditch Users Association proposes to lay culvert for 900 feet where the ditch is in very bad repair and runs through a residential area that has a lot of foot traffic. This will allow for the protection of the public and protection of property. Presently the ditch in this area consists of crumbling concrete covered in parts by rotting boards. Currently there is loss of water through seepage and possible disastrous losses to property if the canal were to fail totally in that area. The area in question is a high-traffic area for individuals crossing the ditch between residential neighborhoods and the downtown area of Livingston. The large holes in the ditch cover allow children to play in the ditch when there is no water. This leaves them vulnerable to physical injury from ditch wall collapse. The potential for drowning from falling through the ditch cover is also great. By running the ditch through culvert and covering the culvert, the ditch will be safer to humans and

allow for uninterrupted water flow by eliminating the need to shut down the ditch to make repairs every time leakage is reported. Improving the ditch in this manner would be a definite water conservation measure.

Technical Assessment:

Project Background:

The Livingston Ditch consists of a diversion dam in the Yellowstone River and a canal approximately ten miles long with a maximum capacity of 80 cfs. The ditch meanders through town servicing primarily small users, though there are still some larger users that depend on the ditch as the primary water supply for commercial agricultural operations. The project site consists of 900 feet of ditch that has a wooden cover. The cover is dilapidated from years of neglect and poses a substantial risk to public safety as this area receives substantial foot traffic adjacent to the canal. The section that would be repaired through this project is located on a steep hill. A breach in the canal at this point would result in substantial damage to personal and public property.

Technical Approach:

The goal of the project is to replace 900 feet of open ditch with buried metal culvert. The wooden cover that is currently in place is a substantial hazard to public health and safety. The culvert would be 5 feet in diameter so as to more easily hook-up to a 60-foot section that was replaced with culvert during emergency repairs in May of 1998. The applicant has not completed sufficient analysis to determine whether or not a smaller culvert would provide adequate flow.

The applicant did address the alternative of replacing the existing wooden cover with a new wooden cover constructed of pressure treated lumber. The proposed alternative is preferred as maintenance would be greatly reduced, down slope homes would have greater protection from a potential breach, and a walkway would be created over the top. From an economic standpoint, the applicant does not provide sufficient documentation to determine the best alternative.

The applicant has not completed a technical analysis of the project site sufficient to determine the technical feasibility of the project. DNRC is concerned that the geographic constraints resulting from the steep hillside could result in substantially greater project costs than anticipated in the application. The application did not discuss the technical issues such as soils, slope, volume, and velocity, that would be addressed in the engineering phase of the project. However, funds for engineering are included in the project budget.

Project Management:

Project management will be performed by the directors of the Livingston Ditch Users Association with assistance from the district secretary. Additional assistance will be provided the project engineer, as well as administrative assistance from officials of the city of Livingston.

Financial Assessment:

RRGL Grant Costs

Administration	\$ 2,560
Engineering	3,200
Construction	58,240

Total Grant Costs \$ 64,000

Estimated Total Project Costs \$ 80,000 RRGL Grant Share = 80%

The project budget was developed with the assistance of a local contractor that has performed work for the Livingston Ditch Users Association in the past. The unit costs appear accurate, however, without a more in-depth analysis of the technical requirements necessary to complete the project, it is uncertain whether the budget is sufficient to complete project. The applicant did not include any funds in the project for contingency expense.

The Livingston Ditch provides water for 160 users. Total annual revenue for the association is approximately \$25,000. The association currently assesses \$77.50 minimum per user for ten miner's inches. The association will assess a one-time fee of \$100.00 per user in support of the project.

Benefit Assessment:

The project site is a popular public thoroughfare, and covering this section of the ditch will greatly enhance the surrounding area. The project is multiple use as a irrigation structure and pedestrian path. The project has excellent public support. Public interest is achieved through improved safety, improvements in the water conveyance, and prevention of a ditch failure that would result in great loss to public and private property.

The improvement to irrigation efficiency is not considerable since the canal reach addressed by the project is so short. A more comprehensive approach that addresses infrastructure problems along the ten miles that make-up the ditch would result in greater public and resource benefits.

Environmental Evaluation:

The project will not result in any long-term adverse environmental impacts. Impacts associated with project construction will be short-term in nature and only to the extent of a temporary nuisance resulting from dust, noise, and equipment traffic.

Funding Recommendation:

DNRC does not recommend project funding at this time. A more complete technical analysis is necessary to determine project feasibility under the proposed budget.

Applicant Name: Park Conservation District
Project Name: Upper Yellowstone River Cumulative Effects Investigation

Amount Requested: \$ 299,940 Grant

Other Funding Sources: \$ 150,940 USGS
 22,500 NRCS
 30,000 FEMA
 96,000 State/Federal (in-kind)
 40,000 (Funds being sought)

Estimated Total Project Cost: \$ 639,880

Amount Recommended: No Funding Recommended

Project Abstract: (Prepared and submitted by applicant.)

The upper Yellowstone River supports important domestic, agricultural, and recreational uses. Recent floods of 1996 and 1997 have accelerated bank erosion, introduced large amounts of gravel into the channel, and reduced the overall stability of the channel in some segments. In response, individual landowners most affected by flood damage have proposed channel modifications to reduce erosion and protect their resources. Concern about the effects of these and other possible channel modifications led to the creation of the Governor's Upper Yellowstone River Task Force in November 1997. The task force has provided a public forum for diverse watershed and river users to discuss river channel problems and potential solutions. Permitting agencies and many individuals involved in the process agree that a comprehensive investigation of the cumulative effects of river channel modifications is needed to ensure that the best long-term solutions to problems are developed.

This investigation will (1) develop tools for the analysis of cumulative effects of river channel modification, (2) inventory channel and floodplain resources potentially affected by channel modifications, and (3) evaluate cumulative effects of proposed channel modifications on the channel and floodplain resources. The investigation will be conducted for an 80-mile segment (valley miles) of the Yellowstone River between Gardiner and Springdale, Montana.

In Phase I, information on historic river channel changes, river hydraulics, and sediment transport will be collected and analyzed to provide tools for the analysis of cumulative effects. Floodplain and channel resources (riparian and wetland vegetation and fish and wildlife habitat, spring creeks, grazing and hay land, etc.) will be inventoried in Phase II. In Phase III, we will analyze the potential cumulative effects of a variety of proposed and alternative channel modifications. Phases II and III will include multiple opportunities for public participation. The investigation will require three years to complete and will start in the summer of 1999.

Technical Assessment:

Project Background:

The Governor's executive order (signed November 5, 1997) provides clear direction that a cooperative approach be developed to examine river channel problems and to formulate solutions that preserve the integrity of the Yellowstone River. The Upper Yellowstone River Task Force also created under this order has provided a public forum for regulatory agencies, landowners,

recreational and agricultural water users, and other interested persons, to discuss channel problems and confront the difficulties associated with implementation of river channel solutions.

Flooding during 1996 and 1997 runoff resulted in significant property loss. Large areas of agricultural land were eroded and existing bank protection in many areas was damaged. Money spent on channel repairs will likely consist of a mixture of private and public money. To develop cost-effective and environmentally sound solutions to channel problems, it is important to understand the causative factors so that any money spent is strategically used. It is equally important to ensure channel work that is proposed at one location would not create new problems upstream or downstream. The proposed cumulative effects investigation will provide the basis for wise expenditure of both private and public money.

Technical Approach:

Central to the proposed cumulative effects study is a collaborative public involvement process which, combined with the results of the scientific and engineering investigations, will allow identification of the nature and extent of existing and potential problems and provide data and recommendations relevant to the long-term health of the system. An important part of this effort is development of specific information for the purposes of individual regulatory agencies (USFWS, DFWP, DEQ, DNRC, etc.)

The U.S. Army Corps of Engineers has requested funding for a study from Congress as part of its annual budget for the past several years and plans to do so for the coming federal fiscal year. Though not yet finalized in detail but sufficient for comparative purposes, the Corps study could possibly address some of the same proposed activities in this proposal. The same holds true for a 319 grant application submitted to DEQ by the applicant. If the 319 grant is approved, then the Phase I Task Geomorphic Hydraulic Analysis of the RRGL study, which includes identification of historical channel changes/processes, may be duplicated. The applicant must work closely with DEQ to eliminate any overlap between RRGL and 319.

Phase II description of channel and floodplain resources and Phase III administrative framework from evaluation and monitoring of cumulative effects would be unaffected by the 319 grant proposal. Another study proposed by USFWS also has the potential of receiving congressional support and funding. This proposal would study the entire 670-mile length of the Yellowstone and take approximately five years to complete.

Project Management

The project would be administered by the district administrator for Park County Conservation District. With the funds requested in this application and matching funds from NRCS, the district clerk would be budgeted to work half-time on the administration of the project. The Upper Yellowstone River Task Force would provide administrative guidance, and Chuck Dalby of the DNRC Water Management Bureau would provide technical advice.

Financial Assessment:

RRGL Grant Costs

Salaries and Benefits	\$ 134,870
Contracted Services	67,000
Supplies and Materials	9,000

Equipment	46,500
Communications	1,750
Travel	31,820
Rent and Utilities	3,000
Miscellaneous	6,000
Total Grant Costs	\$ 299,940

Estimated Total Project Costs \$ 639,880 RRGL Grant Share = 47%

Project salaries and benefits are targeted for USGS personnel and Park Conservation District for surveying, modeling, mapping, and analysis and project administration over the three-year study period. This amount will be matched by \$278,870 in agency salaries and benefits. Contracted services include the hiring of consultants to prepare floodplain maps, photography and interpretation, sediment analysis, GIS set up and data entry, and maintenance. Considering the expertise needed, person hours allocated over the three-year period, field time needed at the site, and the amount of match funds pledged as outside non-RRGL contributions, the costs appear reasonable for the study designed.

Environmental Evaluation:

This investigation is not expected to generate any long-term adverse environmental impacts.

Benefit Assessment:

Flooding during 1996 and 1997 runoff resulted in significant property loss. Large areas of agricultural land were eroded and existing bank protection in many areas was damaged. In addition, large areas of riparian habitat, crucial for many migratory waterfowl and neo-tropical bird species, were destroyed. Many of the areas spring creeks, so-called because they originate from springs located within the floodplain, were threatened. These spring creeks, known for their blue ribbon fishing and home to a native cutthroat trout fishery, constitute an invaluable public resource. As a result, regulatory agencies have received numerous permit applications for repair and construction of new channel stabilization measures and the remedial and preemptive projects are being undertaken on a localized basis. This Band-Aid approach is difficult to overcome because the permitting process tends to focus on single projects and property owners and managers use a variety of consultants to examine and develop solutions to their individual river problems.

The investigation is designed to provide the information necessary to make informed decisions regarding solutions to river channel problems and overall management of the river and floodplain. A key aspect of the proposed project is a collaborative public involvement process, which will provide needed social and economic information about the people and communities the river supports. This public input, combined with the results of the scientific investigation, will allow agencies and the affected public to make responsible decisions based on the behavior and characteristics of the overall river system and the needs of the community.

Funding Recommendation:

No funding is recommended. The applicant applied for funds to both the RRGL and RDGP grant programs. Funding is not allowed through both programs simultaneously (90-2-1112, MCA). Due to the amount of the request, it is more appropriate to fund this project through RDGP.

Applicant Name: Sage Creek County Water District
Project Name: "A-Closed" Watershed Classification

Amount Requested: \$18,500 Grant

Other Funding Sources: \$2,000 Project Sponsor

Estimated Total Project Cost: \$20,500

Amount Recommended: \$18,500

Project Abstract: (Prepared and submitted by applicant.)

The Sage Creek County Water District provides drinking water to a rural area east of the Sweet Grass Hills in north central Montana. The district's water source is a spring box with laterals located in a small valley formed by Black Jack Butte on the north side and East Butte on the south. The water source is approximately five miles uphill from the first service connection.

With assistance from Montana Rural Water Systems, the district has completed a wellhead protection/source water protection plan. The district may need to install a filtration system unless the surface water sources can be classified as "A- Closed"(ARM 16.20.616).

The purpose of the proposed project is to assist the district with the A- Closed classification. DNRC grant funds will be used to hire a qualified consultant who will prepare the management plan necessary to protect the water source. The management plan will need to be accepted by the affected property owners. If the district is successful in obtaining the A- Closed classification, the need to install a costly filtration system will be eliminated. Because the classification process may be appropriate to other small rural water systems, the consultant will also prepare a how-to manual to help other water districts and associations qualify for the A- Closed designation. The statewide implications of this project are significant. Although the A- Closed classification is clearly the most cost-effective solution for rural systems needing to comply with regulations governing all public water systems, the district was unable to find an example of an existing system that has been able to secure that classification.

The total estimated cost of the proposed project is \$20,500. Sage Creek County Water District will contribute \$2,000 and is seeking a grant from the Renewable Resource Program for the balance of the cost.

Technical Assessment:

Project Background:

Sage Creek County Water District operates a rural water system with 47 service connections in an area east of the Sweet Grass Hills. The source of water for the district is an infiltration gallery situated nearby Sage Creek in a small valley on the northeast side of the East Buttes area of the Sweet Grass Hills. Land use in the watershed is limited to grazing and harvesting from a small hayfield south of the well and pasture.

The water district is concerned that activities in the watershed could contaminate Sage Creek. As a result, the district would be required to install prohibitively expensive filtration equipment. In an

effort to protect the water source, the district seeks to secure an A-Closed classification for the watershed. The A-Closed classification would prohibit activities that could threaten water quality in the watershed. The district has received support of the upstream landowners on Sage Creek, and is now seeking funds to hire a consultant to assist in meeting the criteria for the A-Closed classification.

Technical Approach:

The goal of the project is to secure an A-Closed classification for the Sage Creek watershed. In addition, the consultant retained to complete this work will also prepare a guidebook that lays out the process for securing the A-Closed classification. Other rural watersheds would then have a manual to assist them with this process in the future.

The A-Closed classification requires the submission to DEQ of water quality data sufficient to support the classification in addition to a watershed control program that demonstrates the district's ability to control land use activity in the watershed sufficient to maintain the A-Closed classification. The application does not provide a work plan that shows how a consultant will complete the tasks necessary for successful project implementation. This problem stems from conflicting information and a general lack of technical support from DEQ on this issue. The goal of the project is worthy, but without a work plan that demonstrates the major tasks necessary to complete the project, it is difficult to determine whether the project can be completed on schedule and within the project budget.

The applicant states that designation of the A-Closed classification will prevent the district from having to install expensive filtration equipment. It is true that with the A-Closed classification the district will have greater control over activities in the watershed thereby reducing the likelihood of contamination that would require the installation of filtration equipment. However, under no circumstances will the classification in and of itself prevent filtration. Irrespective of the stream classification, the water source must meet the water quality criteria for public water supply without filtration.

Since the district submitted this application, DEQ has determined that the water source is a groundwater source. Without the concerns presented by the influence of surface water on the water source, the district does not need to consider filtration and the attendant costs that would result from filtering the water supply.

Project Management:

The district's board of directors will be responsible for overall project management. The district will hold public meetings to discuss the proposed watershed control program after approval of project funding. The consultant hired to complete the project will be responsible for coordinating with DEQ in the development of a manual to assist other communities interested in securing the A-Closed classification.

Financial Assessment:

RRGL Grant Costs

Contracted Services	\$ 14,500
Printing/Publication	2,000
Travel	2,000

Total Grant Costs \$ 18,500

Estimated Total Project Costs \$ 20,500 RRGL Grant Share = 90%

Project costs were calculated on the basis of input from local consultants, but in the absence of a detailed work plan, it is difficult to determine whether or not the budget is overstated or understated. Costs for travel and printing/publication are in line with similar projects.

Sage Creek County Water District provides services for 59 households in addition to five gpm to the Sage Creek Hutterite Colony. Current user rates are \$80.00 per/use per month. Typically, one use is sufficient to supply the needs of one household. The district will assess a one-time fee of \$42.55 per use to support the project.

Benefit Assessment:

The long-term benefits of the project are significant. The Sage Creek watershed is a highly unusual water source. This stream has characteristics that are typically found in more mountainous regions of the state. Sage Creek supports an excellent fishery of brook and rainbow trout. The excellent water quality found in Sage Creek is unusual for an area that is typically plagued with poor surface and groundwater quality. The A-Closed classification sought by the applicant will contribute greatly to the long-term protection of this resource.

The guidebook that will be produced could serve other communities in establishing effective protection strategies for municipal watersheds. However, DNRC feels that this type of effort should come in the form of technical assistance from DEQ. The designation of surface water classifications is primarily a process issue, and DEQ should provide adequate assistance to those communities that seek to protect their watersheds through the designation of surface water classifications.

Environmental Evaluation:

No significant long-term adverse environmental impacts will occur as a result of this project. The watershed control program that will be developed as a result of the project will provide an effective mechanism for implementing measures to protect water resources in the watershed.

Funding Recommendation:

DNRC recommends no funding for this application. The applicant has demonstrated the need for this project and further demonstrated substantial public benefits that would result from the A-closed designation. However, the technical issues associated with securing this classification are not sufficient to warrant grant funding. The problem the applicant faces is primarily a process issue with DEQ. DNRC believes that DEQ is capable and has the responsibility to provide the applicant with the technical assistance necessary to complete the project.

Applicant Name: City of Thompson Falls
Project Name: Distribution System Improvements

Amount Requested: \$100,000

Other Funding Sources: \$500,000
400,000
1,202,085
469,215

Estimated Total Project Costs: \$2,671,300

Amount Recommended: No Funding Recommended

Project Abstract: (Prepared and submitted by applicant.)

Ashley Creek has been the primary water source for the residents of Thompson Falls since 1898, when the Northern Pacific Railroad installed a water system operated by a private contractor. The near pristine water met quantity and safety demands for many years, requiring only chlorination.

However in 1997 as a result of an avalanche, DEQ issued a boil water notice and further directed the city to either provide filtration or abandon this source by August 15, 1998. Since the system is currently producing twice the amount of water required for the city's needs, filtration of present production amounts will place an excessive financial burden on residents.

Of the total \$2,671,300 requested, \$1,330,900 will be for improvements to those portions of the system allowing excessive water loss. Selected water meters, fire hydrants, and undersized distribution lines are targeted for replacement. Enlargement and line looping will enhance the residual pressure in the system, contributing to improved fire protection and alleviating health risks. These improvements will reduce the cost of filtration by reducing the amount of water that must be filtered.

The City of Thompson Falls will manage this project with the assistance of a qualified engineering firm. For the last 15 years the city clerk, Kathlyn Denke, has been involved in municipal government and all phases of the grant process. The clerk will maintain oversight of the project manager, Kathrine Holland.

This project will ensure Thompson Falls residents a reliable water distribution system, improved fire protection, and, most importantly, quality water. It will be less costly to address the DEQ determination and well construction as an auxiliary water source. And finally, a precious natural resource will be developed, managed, and safeguarded for future generations.

Technical Assessment:

Project Background:

Ashley Creek has been the main source of water supply for Thompson Falls since the late 1800s. Water rights to the creek are shared with a rancher who has senior rights. At times in the summer there is not sufficient flow to serve both the city and the rancher. The city must supplement its supply with a 750-gpm well. The well has elevated levels of iron and manganese and is not preferred by residents. The city has approximately 600,000 gallons of water storage and the

distribution system leaks so badly that water demand is twice what it should be for a community this size. Fire protection is marginal in some sections of the city. Prior to 1997, filtration was not required of the Ashley Creek water supply. In 1997, two avalanches occurred that permanently damaged the creek and increased instream turbidity. DEQ considers this condition to be a public health hazard. A boil order has been issued that consequently requires filtration of the Ashley Creek water supply.

Technical Approach:

Several water treatment alternatives were investigated for Ashley Creek as well as the development of alternate groundwater sources. It was determined that it would be most reliable and cost-effective to develop the springs that feed Ashley Creek and to develop a new well as back up to the Ashley Creek springs. These water supply improvements would eliminate the public health threat associated with continued use of the surface water supply and allow DEQ to remove the boil order. The springs are currently undergoing a groundwater under the influence of surface water analysis. The early results look good, but care must be exercised to ensure the springs will qualify as a true groundwater source. A hydrogeologist studied probable groundwater sources for the new well and recommended the development of the proposed well because of improved water quality, wellhead protection, and available quantity.

The distribution system was studied to determine to identify areas of leakage and to establish the improvements necessary for improved fire flows. In addition to water supply improvements, the project proposes to replace approximately 13,000 lineal feet of water main, 26 hydrants, and 100 old water meters. The flow model demonstrates significant fire flow improvement and the engineer estimates that distribution system leakage could be reduced by 25% or, on average, 72,000 gpd.

Project Management:

The mayor and city council would be responsible for the contract with DNRC and will have ultimate responsibility for the overall management of the project. The city has designated a city staff person as the project manager who will serve as the city's liaison and would be responsible for the day-to-day management of the project and ensure compliance with all applicable regulations. The city clerk will work with the designated project manager to ensure the appropriate records are being maintained, funds are being expended properly, and that additional city finances are available to support the project as needed. The city's public works director will review all final engineering plans and coordinate operations with the engineer and contractor during construction.

Financial Assessment:

RRGL Grant Costs

Personnel Costs	\$ 2,250
Audit Fees	250
Engineering	17,000
Construction	73,200
Contingency	7,300
Total Grant Costs	\$ 100,000

Estimated Total Project Costs \$ 2,671,300 RRGL Grant Share = 4%

The estimated cost of the project is \$2,671,300 and is to be funded with a \$500,000 TSEP grant, a \$400,000 CDBG grant, a \$100,000 RRGL grant, a \$1,202,085 RUS grant, and a \$469,215 RUS loan. Grants represent approximately 83% of the project funding. The average water rate would increase from \$23.50/month/user to \$27.13/month/user if the project is implemented with the proposed funding package. The average monthly sewer user rate is \$31.57. The combined water and sewer user rate with the project as proposed in this application would be \$58.70/month/user. A target rate analysis was not presented in the application.

The water supply portion of the project cost is approximately \$1.34 million and the distribution cost of the project is approximately \$1.33 million. The water supply and distribution system costs are reasonably documented and consistent with similar projects. Applications for TSEP, CDBG, and RUS are pending

Benefit Assessment:

The water supply improvements associated with this project will eliminate a public health concern associated with existing surface water supply and allow the community to come into compliance with state and federal drinking water regulations. Public safety will be increased with the improvement to fire flows and additional looping will eliminate the public health concern associated with dead-end lines and poor disinfection performance. Significant water conservation will be realized with the reduction in distribution leakage. Improved municipal water efficiency will improve the availability of water for irrigation. The 1,600 customers of the Thompson Falls water system will benefit from avoided fee increases.

Environmental Evaluation:

The proposed improvements to the distribution and water supply facilities would have minimal adverse impact on the environment. The proposed improvements will have a net positive impact on the environment by eliminating the leakage of water and reducing power costs. Some temporary adverse impact can be expected during the construction of the springs and pipelines. In particular, wetlands could be disturbed. All appropriate permit requirements have been identified and would be pursued to ensure all environmental impacts are mitigated.

Funding Recommendation:

DNRC recommends no funding. Thompson Falls was approved for project funding for distribution line improvements by the 55th Legislature. Due to the project rank, funds were not immediately available. Funds from the last biennium have since become available and this project has been funded using monies appropriated during the last biennium.

Applicant Name: Tin Cup Water and Sewer District
Project Name: Tin Cup Lake Dam Restoration Project

Amount Requested: \$ 100,000 Grant

Other Funding Sources: \$ 84,000 1997 Renewable Resource Loan Proceeds
 38,800 District Reserves
 200,000 Unknown Source

Estimated Total Project Cost: \$ 422,800

Amount Recommended: No Funding Recommended

Project Abstract: (Prepared and submitted by applicant.)

Under the auspices of the National Dam Inspection Act - Public Law 92-367, the Tin Cup Lake Dam has been designated a "high-hazard" dam by the U.S. Army Corps of Engineers, USFS, and DNRC. The Corps, USFS, and DNRC consider the possibility of loss of life in the event of a sudden dam failure to be high.

The primary purpose of the Tin Cup Lake Dam Restoration Project is to bring the designated high-hazard Tin Cup Lake Dam into compliance with current state and federal dam safety standards.

The onsite work required includes the widening of the existing spillway; the construction of a concrete inlet structure and trash rack; the installation of a canal gate, stem, and wheel control; filling of the upstream and downstream dam face; rip-rapping the upstream dam; face and installing a Parshall flume flow measuring device.

The public benefits attributed to the Tin Cup Lake Dam include: (1) agriculture irrigation; (2) groundwater recharge; (3) flood control; (4) controlling and maintaining instream flows for fisheries; (5) the enhancement of public recreation opportunities in the area; and (6) improving water quality by controlling streambank erosion and stream sedimentation on and along Tin Cup Creek.

The conservation and subsequent multiple use of water is the real measure of the worth of a water development project. The Tin Cup Lake Dam Restoration Project offers the State of Montana the opportunity to provide the financing mechanism to preserve an existing resource that has been and will continue to be used and enjoyed by hundreds of Montanans.

Technical Assessment:

Project Background:

Tin Cup Lake Dam is located 14 miles southwest of Darby in the Selway-Bitterroot Wilderness Area. Constructed in 1906, the dam is 300 feet long and 20 feet high. The operational storage capacity of the reservoir is 2,400 acre-feet, and it provides late season irrigation for 2,800 acres in Ravalli County.

The dam is designated "high hazard" in accordance with state and federal dam safety standards. Recent major improvements were made to the dam late in 1997, consisting of slip lining of the outlet works pipe, removal of the antiquated inlet structure, and some cleanup work. These improvements were designated Phase I improvements. This application, as submitted, is for Phase II

improvements consisting of dike regrading, spillway improvements including widening, and the installation of a new inlet, trash rack, headgate, and measuring device.

In May of 1998, a leak was detected in the dam. In response, an emergency was declared and USFS lowered the crest elevation of the spillway about ten feet, effectively lowering the pool elevation of the reservoir and reducing the chance for a catastrophic break and ensuing flood.

Technical Approach:

The goals and objectives of this project are to bring Tin Cup Lake Dam into safety compliance while maintaining its operation. Yet to be determined, the scope of work is changed from the scope presented in the application. Alternatives include 1) breaching the dam or 2) constructing a reinforcing berm on the upstream side of the dam to strengthen it, lining the upstream face of the dam to eliminate the source of the leak, and making other improvements to maintain the safe operation of the dam.

At the time of this writing, it is undetermined as to whether the dam will be permanently breached, or whether the district will be permitted to reconstruct the existing structure to make it safe for at least partial use, thereby providing reduced late-season irrigation storage.

Project Management:

Formed in 1997, the Tin Cup Water and/or Sewer District has financial control and responsibility for the operation of the system and the construction of this improvements project. The district employs the services of a consultant for advice and for management of technical issues related to the compliance upgrades to Tin Cup Lake Dam.

Financial Assessment:

The district borrowed \$304,204 through the Renewable Resource Loan Program in 1997 for construction of Phase I improvements to the dam. Nearly 20% of the proceeds were spent by the district in legal fees associated with dissolution of the Tin Cup Water Company and the formation of the new district, thus leaving a serious deficit in funding available for Phase II. As presented, \$200,000 included in the budget is from a yet to be determined source. In actuality, because of the emergency which has occurred this year, the district has no money and it is obligated to compensate USFS for the costs it has incurred in lowering the spillway. The amount is not known at the time of this review, but is estimated to be several hundred thousand dollars payable over a three-year period. The district includes approximately 3,000 acres, 1,532 of which are irrigated. Eighty-seven irrigators are assessed a total of \$94,134 annually, with individual assessments based upon the categories of shares held. The average assessment is \$61.45 per irrigated acre, which will not be affected by a grant award.

Benefit Assessment:

Maintaining the dam will provide late-season irrigation to 2,800 acres. The majority of these acres are in small parcels and are not associated with commercial farm and ranch operations. The project will provide resource enhancement value through the preservation of stream flows during late summer and particularly during dry years. Upgrades to the dam to bring it into compliance with dam safety standards will protect lives and property downstream, thereby providing a specific benefit to citizens other than irrigators.

Environmental Evaluation:

Tin Cup Lake Dam is located in a designated wilderness area. It is an environmentally controversial issue as to whether or not the dam should ever have existed. Now that it has failed, it is also a controversy as to whether it should be breached and totally removed, or whether the district should be allowed to restore it to provide storage for non-commercial irrigation purposes.

The actual project will not initiate new or serious adverse environmental impacts. To not restore the dam will require cleanup not only at the dam site but also around the lakeshore, since lowering the lake to its natural elevation will expose stumps, mud flats, and other unsightly features that have been flooded at times of full pool for over 90 years.

Construction will require NEPA and MEPA compliance, including the preparation of an EA and possibly an environmental impact statement. Construction is very expensive since equipment cannot be walked into the area, but must be airlifted in. No motorized travel is allowed within the wilderness boundaries.

Funding Recommendation:

The district has requested a grant in the amount of \$100,000. The scope of work has yet to be determined because of the emergency that has taken place since May 15, 1998, the date of this application. The source of \$200,000 included in the proposed budget is not known by the applicant. The district borrowed \$304,204 through this program for improvements to the dam in 1997. It is responsible for costs incurred this summer by USFS, probably in excess of \$500,000, but yet to be determined at the time of this writing. The source of repayment is not known. Until a scope of work is defined and accepted by all parties and until the necessary sources of funding are known, funding for this project is not recommended.

Applicant Name: Willow Creek Sewer District
Project Name: Total Retention Lagoon System

Amount Requested:	\$ 100,000	Grant
Other Funding Sources:	\$ 200,000	CBDG Grant
	500,000	TSEP Grant
	101,800	RD Grant
	124,600	RD Loan
	5,000	District Enterprise Fund

Estimated Total Project Cost: \$1,031,400

Amount Recommended: No Funding Recommended

Project Abstract: (Prepared and submitted by applicant.)

Historical Information - The Willow Creek Sewer District formed in the early 1970s. The district constructed its collection and treatment system in 1982. The system consists of 6,000 feet of 8- and 10-inch PVC pipe, a lift station, and a treatment facility designed for 15,000 gpd, or roughly for a population of 150 persons at 100 gpcd, or 131 persons at 114 gpcd.

Problem - The district has outgrown the capacity of its treatment system, which is now frequently

overloaded. Inflows contribute to that overloading, though the flow per capita including inflow is only 114 gpd (see page 12 of facility plan). During overloads sewage leaves without sufficient treatment. Discharge violations of BOD, TSS, and fecal count are chronic, with 57 violations since 1994 (see page 13 of facility plan). Very significantly, sludge has built up in a drainage ditch that leads from the treatment system to the Jefferson River. This open sludge has created a serious health concern and prompted a chain of correspondence with EPA, which has cited this as "a serious violation of the Clean Water Act." EPA has stated that in-place treatment methods for the sludge may be acceptable only if every effort is made to ensure that such violations will not re-occur. The only way to avoid future violations is to have a treatment system properly sized and to control inflow.

Proposed Solution - The district has already addressed the issue of inflow. The engineer and town now see installation of a lagoon system as the only reasonable means of solving its problems with sludge discharge and under-treatment.

Technical Assessment:

Project Background:

Willow Creek Sewer District formed in the early 1970s and constructed a collection system and "package" mechanical wastewater treatment plant designed for 15,000 gpd. The District has outgrown the capacity of the treatment plant that is now frequently hydraulically overloaded. During hydraulic overload situations, raw or partially treated wastewater is discharged from the plant. The plant has been cited for discharge violations (TSS, BOD, and fecal coliform) 57 times since 1994. Due to the conditions, which result in the violations, sludge has built up in a drainage ditch that leads from the treatment plant to the Jefferson River. This raw sewage and sludge has created a serious potential health concern and prompted EPA to act with enforcement actions. Enforcement action effectively requires that the district optimize treatment in the short term, and develop a long-term solution that will not perpetuate the problem or risk financial penalty.

Based on the existing condition, the district contracted with an engineering firm to prepare a facility plan to recommend a new treatment facility.

Technical Approach:

The goals of this project are to replace an aging and under capacity mechanical package wastewater treatment plant by designing and constructing a replacement treatment system. To achieve this goal a facility plan was developed which identified several appropriate alternatives. While the plan identifies potentially appropriate solutions, only a cursory level of alternative development and comparison of alternatives was presented. Based on the analysis, a total retention pond was selected as the recommended alternative.

The analysis is lacking in many dimensions, which was confirmed by DEQ staff currently reviewing the facility plan. A major deficiency associated with the selected alternative is that the lagoon system water balance is based on average conditions rather than the DEQ stipulated conditions (most restrictive year in ten). The result is that if the total retention lagoon were to be constructed as proposed it would be of inadequate volume every other year on average. Under this condition, there exists the potential for catastrophic failure of dikes due to overtopping. It is estimated that this technical error resulted in the engineer estimating area requirements for the lagoon, which are approximately one half of the total necessary for safe and adequate operation.

The inadequate sizing of the lagoon and underestimation of the area requirements results in a high

likelihood that project costs have been significantly underestimated.

The facility plan has not been approved by DEQ, and DEQ staff has several outstanding concerns that have yet to be addressed.

Project Management:

District officials will oversee project management. The project budget appears to provide sufficient and perhaps excessive for project management and implementation. A project management consultant (separate from the design consultant) will coordinate all work. Their experience with similar projects is not documented. The project management budget is significantly larger (in terms of percentage of total project cost) than other similarly sized projects. Further, the project management budget is proposed as a lump sum, which seems inappropriate for the scope of work. The applicant has prepared a facility plan in which the public had the opportunity to participate.

Financial Assessment:

RRGL Grant Costs

Construction	\$ 90,000
Contingency	10,000
Total Grant Costs	\$ 100,000

Estimated Total Project Costs \$ 1,031,370 RRGL Grant Share 9.7%

There are serious concerns that the overall funding package is inadequate due to underestimated construction costs. With the proposed funding package, the average monthly user charges will be approximately \$27.86. This represents an increase of \$8.29/month and is approximately 188% of the minimum target rate of \$14.84. As noted above, it is believed that the construction cost estimates are inadequate and could result in higher rates.

Benefit Assessment:

The public benefits from this project will be significant. The district is under an administrative order to cease discharge of untreated sewage and sludge. EPA has taken an enforcement interest as well.

Due to large fluctuations in flow, the plant is easily overloaded and untreated sewage has often ended up in a drainage ditch adjacent to the plant with a high potential for contact with the public and discharge to the Jefferson River. Sewage sludge exists in the ditch, and the potential for additional deposition exists as long as the package plant remains. Citizen benefits are clear.

By eliminating the discharge with a new treatment system, surface water and groundwater quality will improve, thus achieving resource enhancement. The project does not affect resource conservation. The project is completely consistent with the State Water Plan.

Environmental Evaluation:

The project is projected to have an overall long-term positive environmental impact. The only long-

term potential negative aspect is the opportunity for periodic odors from the lagoons, although the existing plant also produces odors and the plant is close to town. The project sponsor can include design features in the lagoon to allow for maximum mitigation of this potential negative aspect. While a specific site for the lagoons has yet to be selected, with careful consideration most impacts to existing wetlands can be mitigated.

Funding Recommendation:

DNRC recommends no funding. In view of the incomplete technical development which could result in substantial increases in project costs, DNRC recommends no funding at this time. DNRC encourages the applicant to reapply after the preparation of a more comprehensive technical and financial proposal.

Chapter 3

Coal Severance Tax Loans to Public Entities

Application Administration and Project Review Procedures

Applications for public loans are accepted by DNRC's Resource Development Bureau until May 15 of each even-numbered year at the same time other applications are due from public applicants under this program. A \$250 application fee is required with each application for a large public loan. These loans are provided with proceeds from the sale of coal severance tax secured bonds and frequently are offered at a subsidized interest rate. The subsidy is paid with coal tax revenues.

Project Solicitation

Applications for public loans are solicited through the same process DNRC uses to solicit other public grant and loan applications described in Chapter 2. The availability of low-interest loan funds is widely advertised through direct mailings, press releases in association and commercial newspapers, and with contact made during promotional workshops conducted by DNRC, DOC, and DEQ at the local level. The same application form is used to solicit both grant and loan applications.

Application Review

All public loan applications received by the deadline are evaluated for completeness. Those missing documentation, application fees, or other basic requirements are notified and allowed time to submit additional material. After applications are reviewed for completeness, and any additional information needed is obtained from the sponsor, completed applications are given to the team of key reviewers for review and evaluation. Figure 2, in Chapter 2, shows the flow of the application review process. Loans are reviewed to determine financial, economic, and technical feasibility.

Funding Recommendations

All feasible public loan applications eligible for funding receive a favorable funding recommendation if the applicant demonstrates the ability to repay the loan. DNRC's recommendation includes the amount of financing needed to meet project and financing expenses and the interest rate suggested. There is no maximum allowable funding level; public loans are limited to the amount an applicant has the ability to repay under the standard repayment terms and by DNRC's bonding capacity.

Availability of Loan Funds

In 1981, the legislature adopted SB 409 to provide up to \$250 million in Montana coal severance tax bonds. Coal severance tax bonds are issued for financing projects and activities in the state specifically authorized by the legislature. Statutes dictate that loans made from coal severance tax bond proceeds are to be administered by DNRC, and that DNRC is to review each project to determine its technical and financial feasibility.

Although the legislation was adopted in 1981, coal severance tax loans were not issued for the first few years because the constitutionality of the state's bonding authority under this program was initially challenged. In February 1984, the Montana Supreme Court ruled in the state's favor in *Grossman v. State of Montana*, and the first Montana coal severance tax bond was sold to finance

loans during that same year.

In September 1985, the board of examiners adopted a general resolution pursuant to which all subsequent coal severance tax bonds have been issued. A copy of this resolution may be obtained from DNRC. The general resolution requires that bonds issued be secured on a parity basis. This means that all subsequent coal severance tax bond issues have the same right or ability on proceeds flowing into the trust fund to pay bondholders. However, to assure bondholders there always will be enough coal severance tax revenue to meet debt service payments, the general resolution restricts the cumulative amount of bonds that can be issued. This restriction is much more constraining than the \$250 million statutory limit. The general resolution does not allow any additional coal severance tax bonds to be issued if annual debt payments exceed 50% of the coal severance tax revenue allocated to the trust, plus 50% of the loan repayments received from local government borrowers.

Loan Repayment

Coal severance tax revenue is used to pay the difference between payments received from local government borrowers and the state coal severance tax bond payments. Thus, coal severance tax bonds are paid with revenue from payments from local government borrowers along with coal severance tax proceeds.

To implement these repayment provisions, the statute established a fund structure within the permanent coal tax trust fund. Fifty percent of coal severance tax proceeds flowing to the permanent trust fund are first deposited in the coal severance tax bond fund. A portion of the proceeds deposited in the bond fund are transferred to the debt service account to pay for the interest rate subsidies. An amount equal to a year's debt service payment on all coal severance tax bonds is held in reserve in the bond fund.

Proceeds that exceed the subsidy payments and reserve requirement are transferred to the coal severance tax school bond contingency account. This fund was established to provide security to school bonds issued during the 1992-93 biennium. The remaining proceeds are then transferred into the Treasure State Endowment Fund and the coal severance tax permanent fund, which retains the remaining 80% of this income.

With the exception of the Treasure State Endowment Fund, the interest earnings associated with all account balances are transferred to the coal severance tax income fund. These interest earnings are then transferred to the general fund.

Interest Rates

Loans may be provided at a rate less than the rate at which the state bond is sold, for all or part of the term. During the financial review of each loan application, DNRC prepares a funding recommendation that includes a recommended interest rate subsidy. This subsidy is available for loan applicants only. Applicants that receive grant funding in conjunction with a loan do not receive an interest subsidy. Recommendations are developed to be consistent with past direction provided by the Long Range Planning Subcommittee of the legislature. In 1987, the legislature directed that the recommended subsidy for municipal projects typically be based on the user rate as a percentage of the "median household income." The schedule for subsidies with respect to municipal projects is presented below.

1. If less than 1% of the median household income is required to pay user rates, no subsidy

- is recommended;
2. If the user rate is at least 1% but less than 2%, a 1% interest rate subsidy for 5 years is recommended;
 3. If the user rate is at least 2% but less than 4%, a 2% interest rate subsidy for 5 years is recommended; and
 4. If the user rate is more than 4% of the median household income, a 3% interest rate subsidy for 5 years is recommended.

The basic interest rate on coal severance tax loans is determined by the bond market at the time coal severance tax bonds are sold. The rate of interest on most loans from the program will vary in accordance with the rate on the state coal severance tax bonds. The basic rate of interest for each public loan financed from the proceeds of a single bond issue is the same. Subsidies vary, depending on legislative authorization.

Project Management

DNRC reviews each public loan application to determine whether the project is financially feasible. A project is considered financially feasible if sufficient funds can be made available to complete the project, and if sufficient revenue can be obtained to repay the loan and to operate, maintain, and replace the project. After a public loan is authorized by the legislature and the project sponsor is ready to secure financing, DNRC performs a more thorough review of the applicant's ability to repay the loan. At this time DNRC may require access to the applicant's most recent financial statement, budget document, and other documentation in order to assess whether the proposed project is truly financially feasible.

If the borrower provides documentation of the ability to repay a loan and all legal requirements to incur debt are met, a bond purchase agreement is prepared and executed to make specific requirements and covenants with respect to a project or improvements to a project being financed. Borrowers must acquire all property rights necessary for the project, including rights-of-way and interest in land needed for a project's construction, operation, and maintenance. As appropriate, these and other stipulations also are contained in a bond resolution. Unless otherwise authorized, each loan--including principal and interest--shall be payable over a term approved by DNRC not to exceed the term authorized by the legislature. The cost of issuing the state's bond also is paid by borrowers.

Each borrower must agree not to sell, transfer, lease, or otherwise encumber the project, any portion of the project, or interest in the project without DNRC's prior written consent. Further, the borrower must notify DNRC of any changes or modifications in a project either before or during construction. Borrowers are required to acquire and maintain, with respect to the project, property, casualty and liability insurance. Insurance policies must name DNRC as a certificate holder for notification purposes.

For local government revenue bonds, borrowers must establish a system fund to segregate the revenue of the system or district. Within the system or district fund, the following accounts are generally established: construction account, operating account, revenue bond account, reserve account, replacement and renewal account, and surplus account. These accounts ensure that the system's revenue and other funds are properly applied in a manner reasonably satisfactory to DNRC.

Loans are disbursed by warrants drawn by the state auditor, or by wire transfers authorized by the state treasurer in accordance with the provisions of this rule and the bond resolution. No

disbursement of any loan funds shall be made unless DNRC has received from the borrower (1) a duly adopted and executed bond resolution in a form acceptable to DNRC; (2) an executed bond in a principal amount equal to the loan amount, also in a form acceptable to DNRC; (3) a certificate from an official of the governmental unit stating that no litigation is threatened or pending that would challenge the governmental unit's authority to undertake the project, to incur the loan, to issue the bonds, and to collect revenue; (4) an opinion from the bond counsel that the bond is a valid and binding obligation of the borrower payable in accordance with its terms; and (5) any other closing certificates or documents that DNRC or the bond counsel may require.

Project Monitoring

Borrowers must maintain proper and adequate records of accounts that show the complete and correct entries of all receipts, disbursements, and other transactions related to the project and, if applicable, the monthly gross revenue derived from the project's operation. Any segregation and application of the gross revenue resolution also must be shown in such reasonable detail as may be determined by the borrower in accordance with generally accepted accounting practices and principles.

Loan agreements require quarterly progress reports, expenditure reports, a final report, and annual financial reports over the term of the loan. Projects are closely monitored each quarter when quarterly reports are submitted. Borrowers submit documentation for all expenditures and these are checked against the loan agreement.

Under the usual terms of DNRC's bond purchase agreement, each borrower must comply with reporting requirements during the construction period and continue to do so throughout the term of the loan. According to these requirements, within 180 days after the close of each fiscal year, the borrower must prepare and supply to DNRC an appropriate financial report with respect to the project for such fiscal year. Where applicable, this report includes a statement that details the project's income and expenditures for the fiscal year; the identification of capital expenditures that separate them from operating expenditures; a balance sheet as of the end of the fiscal year; the number of premises connected to the project at the end of the fiscal year; and the amount of cash on-hand in each account of the fund at the end of the fiscal year. The borrower must also provide a list of the insurance policies and fidelity bonds in force at the end of the fiscal year, that shows the amount of coverage, the risks covered, the name of the insurer or surety, and the expiration date of the policy or bond.

Figure 4 Resource Development Public Loans

Coal Severance Tax Loans

ID Number	Type	Applicant	Balance due	Closing	Termination
1) WDL-86-3050	CST	Anaconda-Deer Lodge County	\$300,215	1/08/1986	1/20/2006
2) WDL-93-3160	CST	Beaverhead Co/Red Rock W & S	2,186,797	8/06/1992	7/02/2112
3) WDL-85-3015	CST	Belgrade, City of	456,434	1/21/1985	1/21/2005
4) WDL-85-3043	CST	Bitterroot Irrigation District	829,381	9/17/1985	2/17/2016
5) WDL-91-3149	CST	Bozeman	286,539	4/01/1991	5/23/2011
6) WDL-89-3125	CST	Bozeman, City of	529,980	5/23/1989	5/23/2009
7) WDL-87-4395	CST	Broadwater Power Project	21,735,000	11/05/1987	11/05/2007
8) WDL-87-43951	CST	Broadwater Power Project	1,795,000	11/05/1987	11/05/2007
9) WDL-86-3053	CST	Charlo Water District	18,745	12/04/1985	12/04/2005
10) WDL-93-3165	CST	Columbia Falls, City of	990,291	12/31/1993	12/31/2013
11) WDL-85-3010	CST	Conrad	134,324	10/29/1984	10/29/2004
12) WDL-85-3029	CST	Culbertson, City of	328,108	7/01/1985	7/01/2005
13) WDL-88-3096	CST	Denton, City of	130,586	8/31/1987	9/01/2007
14) WDL-93-3162	CST	Dutton, Town of	124,176	9/15/1992	6/08/2012
15) WDL-93-3162a	CST	Dutton, Town of	22,216	9/15/1992	6/08/2012
16) WDL-85-3048	CST	East Bench Irrigation District	559,750	6/29/1987	7/02/2017
17) WDL-88-3104	CST	East Helena	315,916	2/02/1988	2/02/2008
18) WDL-87-3079	CST	Ekalaka	126,269	8/15/1986	8/15/2006
19) WDL-85-3014	CST	Ennis, Town of	93,674	11/30/1984	11/30/2004
20) WDL-96-3200	CST	Ennis, Town of	698,309	5/15/1996	5/01/2016
21) WDL-91-3147	CST	Fairview, City of	208,213	11/26/199	7/01/2010
22) WDL-93-3163	CST	Flathead Co	3,220,384	12/31/1992	7/05/2013
23) WDL-93-3174	CST	Forsyth, City of	339,016	11/01/1993	5/14/2013
24) WDL-96-3203	CST	Forsyth, City of	293,848	2/27/1996	11/01/2015
25) WDL-86-3054	CST	Fort Benton, City of	434,151	12/30/1985	12/30/2005
26) WDL-98-3246	CST	Fort Benton, City of	520,480	04/15/98	05/01/2018
27) WDL-90-3134	CST	Gardiner Park Co Water Dist.	263,991	11/07/1989	7/01/2009
28) WDL-88-3097	CST	Glasgow, City of	2,076,281	10/02/1987	7/01/2007
29) WDL-91-3146	CST	Glendive, City of	1,404,349	3/14/199	1/01/2011
30) WDL-88-3108	CST	Harlem, City of	280,358	5/08/198	5/01/2008
31) WDL-86-3051	CST	Havre, City of	1,495,882	12/02/1987	12/02/2005
32) WDL-97-3227	CST	Huntley Irrigation System	1,326,531	12/17/1996	2/01/2017
33) WDL 97-3216	CST	Hysham	194,153	6/26/1996	5/01/2017
34) WDL-87-3086	CST	Lakeside County Sewer District	57,241	3/20/1987	3/01/2007
35) WDL-87-3091	CST	Lakeside County Sewer District	528,115	7/07/1987	3/01/2007
36) WDL-98-3245	CST	Lakeside County Sewer District	196,411	01/28/98	11/01/2017
37) WDL-85-3013	CST	Libby, City of	326,696	12/03/1984	1/03/2005
38) WDL-88-3103	CST	Lima	174,212	1/25/1988	2/01/2008
39) WDL-87-3087	CST	Lockwood Irrigation District	167,284	3/26/1987	4/01/2007
40) WDL-90-3138	CST	Miles City	1,198,013	5/21/1990	6/01/2010
41) WDL-89-3114	CST	Mill Creek Water and Sewer Dist.	741,016	10/14/1988	7/15/2020
42) WDL-96-3213	CST	Neihart, Town of	140,663	6/20/1996	6/01/2016

ID Number	Type	Applicant	Balance due	Closing	Termination
43) WDL-89-3117	CST	Ponnera Co. Canal & Reservoir	417,782	1/11/1989	6/01/2009
44) WDL-94-3176	CST	Ponnera Co. Canal & Reservoir	309,402	5/20/1994	6/01/2009
45) WDL-86-3052	CST	Poplar, City of	275,503	11/12/1998	11/12/2005
46) WDL-85-3017	CST	Sage Creek Co Water District	573,655	1/31/1985	1/31/2015
47) WDL-90-3145	CST	Sanders Co Water Dist at Noxon	115,889	6/14/1990	6/15/2010
48) WDL-85-3011	CST	Shelby, City of	308,082	11/02/1984	11/02/2004
49) WDL-87-3078	CST	Shields Canal Water Users Assoc.	20,509	6/01/1986	12/15/2006
50) WDL-91-3148	CST	Sun Prairie Sewer District	448,732	10/15/1990	7/01/2010
51) WDL-93-3173	CST	Sun Prairie Vlg Co Water/sewer	172,792	1/25/1994	11/01/2013
52) WDL-85-3044a	CST	Three Forks, City of	163,628	1/14/1986	1/14/2006
53) WDL-85-3044b	CST	Three Forks, City of	104,962	1/14/1986	7/14/2006
54) WDL-98-3237	CST	Tin Cup Dam Project	304,204	12/10/1997	2/1/2012
55) WDL-85-3047	CST	Upper Musselshell Water Users	113,248	6/12/1985	12/01/2005
56) WDL-88-3101	CST	West Yellowstone, City of	329,385	12/30/1987	7/01/2007
57) WDL-89-3127	CST	West Yellowstone, City of	424,220	6/30/1989	1/01/2009
58) WDL-87-3084	CST	White Sulphur Springs, City of	270,851	3/02/1987	3/02/2007
59) WDL-93-3175	CST	Whitefish, City of	418,539	8/17/1993	12/01/2013
60) WDL-87-3093	CST	Whitehall, City of	48,270	11/09/1987	11/01/2007
61) WDL-91-3152	CST	Wibaux	210,358	6/25/1991	7/01/2011
62) WDL-86-3067	CST	Yellow Water Users Assoc.	17,712	10/11/1985	7/01/2005
63) WDL-86-3060	CST	Yellowstone County	185,534	3/13/1986	3/14/2006
64) WDL-86-3066	CST	Yellowstone County	200,436	3/13/1986	3/14/2006
Total Coal Severance Tax Loans			\$52,682,691		

Figure 5 Water Development Public Loans

ID Number	Type	Applicant	Balance due	Closing	Termination
1) WDGL-85-8005	GO	Antelope Co Water/Sewer Dist	\$67,946	1/03/1986	1/10/2016
2) WDGL-85-3030	GO	Culbertson, City of	52,647	7/01/1985	7/01/2005
3) WDGL-85-8006	GO	Hamilton, City of	57,799	12/08/1986	3/01/2006
4) WDGL-84-8004	GO	Winnett, Town of	45,465	5/30/1984	5/30/2004
5) WDL-89-3128	RRD	Cut Bank N Glacier W/s Dist	65,827	9/28/1990	6/07/2010
6) WDL-85-8006	RRD	Hamilton, City of	14,216	12/08/1986	3/01/2006
7) WDL-87-3082	RRD	Kevin, Town of	104,689	11/10/1986	11/10/2006
8) WDL-88-310	RRD	Lakeside Water District	66,817	7/27/1988	7/01/2008
9) WDL-87-3083	RRD	Park County RSID #7	95,418	12/22/1986	12/22/2006
Total Water Development Loans			\$570,824		

Total Outstanding Public Loans **\$53,253,515**

Figure 6 Public Loans Authorized in 1997 And Seeking Reauthorization

Applicant	Amount	Rate
City of Bozeman-separator Waste Treatment Facility	\$158,850	Market Rate
Sun River Water District-Water System Development	250,000	Market Rate
Hill County Water District-Water Treatment Plant	400,000	2% Below 1st 5 Yrs.
Town of Ennis-Water System Improvements	350,000	1% Below 1st 5 Yrs.
City of Forsyth-Water Treatment Plant Improvements	1,218,916	2% Below 1st 5 Yrs.
Huntley Irrigation District-System Improvements	3,500,440	3.5%
DNRC-North Fork of the Smith-Dam Improvements	1,035,467	4.5%
Seeley Lake-Missoula County	1,600,000	2% Below 1st 5 Yrs.
Total CST Loans Authorized or Reauthorized in HB 8	\$8,513,673	

Figure 7 Public Loans Authorized in 1997 That Have Been Canceled

Applicant	Amount
City of Thompson Falls-Water Distribution	\$100,000
City of Thompson Falls-Water Supply	200,000
Town of Twin Bridges	200,000
City of Chinook	294,000
Glen Lake Irrigation District	195,405
DNRC-Deadman's Basin Project Improvements	111,081
East Glacier Water and Sewer District	76,537
Town of Whitehall	509,000
City of Glendive	2,240,762
City of Whitefish	5,535,800

Chapter 4

Renewable Resource Grants and Loans to Private Entities

Grant Application Administration and Project Review Procedures

As discussed in Chapter 1, applications for water-related projects from any individual, association, for-profit corporation, or not-for-profit corporation may be considered for funding. Only water-related projects may be funded. They must have quantifiable benefits that will exceed costs. Projects must also provide public benefits in addition to any private benefits.

Project Solicitation

To solicit applications from private entities that provide significant public benefits, DNRC has chosen to target public water systems operated by private water user associations and small agricultural projects that need help. The agricultural projects have included inspection on private high-hazard dams and water measuring devices on chronically dewatered streams. To this end, DNRC has contracted with Montana Rural Water Systems, Inc. (MRWS) to solicit projects from private drinking water systems, review projects, and advise DNRC on their validity, feasibility, and performance. Dam and water measuring projects were solicited by the Dam Safety Bureau and the Water Management Bureau of the Water Resources Division of DNRC. In addition to the projects solicited by the above-mentioned organizations DNRC also accepts applications at any time from any water system. Grantees are given one year to complete the project.

Information requested in the application includes:

- Name, address, and telephone number of applicant.
- Description of the problem, including the history and alternative methods of rectifying the problem.
- Complete budget information, including funding sources and cost comparisons of the alternatives.
- Description of the public and private benefits of the project and the need and urgency of the project.
- Environmental impacts of the project, both positive and negative.
- Technical information and approval by DEQ, EPA, or other responsible enforcement agency.

Application Review

All applications received by MRWS were evaluated and ranked according to the extent each application represents a project that is critically needed, will protect public health, provides opportunities for resource conservation, and improves the environment. Applications received by Dam Safety and Water Management bureaus are reviewed by these divisions and then submitted to Resource Development Bureau with a recommendation. Other applications are also evaluated by DNRC staff. All applicants must hold or be able to acquire all necessary lands other than public lands and interests in the lands and water rights necessary for the construction, operation, and maintenance of the project.

Criteria for evaluating private grants are similar to the criteria outlined in Chapter 2 for public grants. As with public grants, private grants are evaluated to determine the potential adverse environmental impacts. Projects that would result in significant impacts would not be recommended for funding by DNRC until an environmental assessment or environmental impact study has been completed.

Recommendations are made to minimize impacts and to ensure that appropriate steps are taken to protect the environment. Any potable water system project must be approved by DEQ to ensure that it meets state standards.

Funding Recommendations

According to Montana's constitution, the legislature may not appropriate funds to private individuals. However, state entities have the authority to distribute public funds to private individuals. To provide for private grants in 1993, DNRC requested a lump sum appropriation to fund private applications under an application process separate from the process used for public grants. In 1993, the legislature appropriated \$100,000 to DNRC to fund grants for private entities. Since then, the legislature has appropriated \$100,000 to DNRC each biennium to fund grants to private entities.

DNRC's role is to review and screen grant requests to determine whether the proposed projects are technically and financially feasible. DNRC will evaluate MRWS, Dam Safety, and Water Management recommendations based on criteria outlined in statute. Within funding constraints, the highest ranked projects will be recommended to DNRC's director for funding. Feasibility studies, research, or public information projects will not be recommended for funding. By law, grant funding for any project may not exceed 25% of the total estimated cost of the project.

Grant Project Management

After DNRC's director has acted on the funding recommendations prepared by staff, DNRC notifies the applicants of their funded or not-funded status. DNRC does not reimburse any project cost incurred before a formal funding agreement is executed.

Project Monitoring

Procedures for monitoring projects, to ensure the program's intent is met, are primarily driven by a project grant contract agreement between DNRC and the project sponsor. The equivalent of one full-time staff person administers active private grants and all private loans. MRWS has agreed to provide technical support to private grant projects during design and construction phases. Budget and staffing constraints preclude DNRC's site involvement at all projects.

Project sponsors must (1) pay all project costs, (2) submit a claim and obtain a reimbursement of allowable costs from DNRC, or (3) arrange for an advance of funds. Invoices may be submitted monthly, and all costs must be supported by invoices, receipts, or both.

Project Evaluation

Grant agreements require expenditure reports, and a final report. During a project's contract term, the project sponsor must submit quarterly reports to DNRC. These reports must reflect the percentage of the project completed, the project costs to date, any problems encountered, and the need for any amendment to the grant contract. In response to changes in project scope, timeline or budget, amendments to grant agreement are prepared and issued. Amendments will continue to be the technique used to modify projects to adjust for changes in scope, budget, or timelines.

Figure 8 Private Grant Applications in Calendar Years 1995 and 1996

Applicant	Requested	Approved
1) Grant Creek Water Users	\$10,000	5,000
2) Highland Park Water Users Assoc.	5,000	5,000
3) Hook-U-Up RV Park	1,906	1,906
4) Pondera Colony	875	875
5) Rock Butte Water Users Assoc.	5,000	5,000
6) Seville Colony	20,500	5,000
7) Tracy Water Users Assoc.	700	700
8) Valley Vista Mobile Park	5,000	5,000
9) Zortman Water Users Assoc.	1,336	1,336
10) Hillside Colony (water)	5,000	5,000
11) Hillside Colony (sewer)	5,000	5,000
12) Glacier Colony	5,000	5,000
13) Big Stone Colony	5,000	5,000
14) Midvale Water Users Assoc.	5,000	5,000
15) Corbin Water Users Assoc.	725	725
16) Treasure State Acres Water Users	2,831	2,831
Total	\$78,873	\$58,373

Figure 9 Private Grant Applications in Calendar Years 1997 and 1998

Applicant	Requested	Approved
1) Elkhorn Hot Springs	\$ 875	\$ 875
2) Hook-U-Up RV Park	1,575	1,575
3) South Hills LOA	5,000	5,000
4) Little Beaver Creek Rch	5,000	5,000
5) Round Butte Water Co.	5,000	5,000
6) Riverview Colony	1,895	1,895
7) Meredith Allen	315	315
8) Alfalfa Irrigation Dist	5,000	5,000
9) South Chester WUA	1,185	1,185
10) Gearhard Von Der Ruhr	50	50
11) Rimrock Colony	5,000	5,000
12) Rimrock Colony	5,000	5,000
13) Melvin Winkles	5,000	5,000
14) Big Creek Lake Res. Asso.	625	625
15) Homestead Acres	2,500	2,500
16) Lockwood WUA	5,000	5,000
17) Jette Lake LOA	5,000	5,000
18) Shakopee Heights	5,000	5,000
19) Linda Eklund	487	487
20) Eagle Creek Colony	5,000	4,000
Total	\$63,507	\$62,507

Private Loan Application Administration and Project Review Procedures

Loans to private individuals also must promote and advance the beneficial use of water and allow Montana's citizens to fully use the state's water. Loan funding became available in 1981 when the legislature earmarked \$350,000 under the former Renewable Resource Development Program to finance loans to private individuals. At the same time, DNRC was given the authority to issue general obligation bonds to finance private loans.

Project Solicitation

Projects are solicited through press release, public meetings and word of mouth. When a bond is sold, a press release is sent to all newspapers in the state. Additionally, promotion by irrigation equipment dealers who are aware of the program, encouragement from local NRCS offices and conservation districts, and presentations by staff at various industry functions serve to solicit applications for loan funding.

Application Review

Loan applications are submitted at any time. DNRC staff reviews the application for completeness and requests additional information when needed. Technical aspects of the project are usually completed by the NRCS or a private engineer. If the project is not designed by a qualified professional, DNRC will closely review the project design and specifications. Financial review is completed by DNRC and includes an evaluation of the applicant's financial strengths, weaknesses, and risk-taking ability. This also includes an evaluation of the security offered and a determination of the relative security position DNRC will have. All of these factors are considered in the recommendation to the loan committee.

Funding Recommendations

Applications that meet feasibility and eligibility criteria are funded if the applicant demonstrates the ability to repay the loan. Projects must be technically and economically feasible, and must pay for themselves over the life of the installation through water savings, increased crop production, or other measurable benefits.

For private individuals, \$200,000 is the maximum loan amount allowable under the Renewable Resource Grant and Loan Program. The 1997 Legislature amended the statute to allow the DNRC to accept applications and loan funds to water user associations. These loans are limited to \$300,000 rather than the \$200,000 for private individuals. Loans are for a term not longer than 30 years or the estimated useful life of the equipment purchased or materials installed. For new irrigation equipment, 15 years is the allowable term; for used irrigation equipment, the term usually is 10 years or less.

Availability of Loan Funds

DNRC has the authority to issue general obligation Renewable Resource bonds totaling up to \$10 million to finance private loans. Changes made by the 1995 legislature allow the DNRC to have up to \$10 million of general obligation Renewable Resource bonds outstanding. Since the program's inception, bonds totaling about \$12.28 million have been issued to finance private loans. A total of \$5.5 million in bonds has been paid off to date leaving a balance of \$7.3 million in outstanding loans and additional bonding authority of \$2.7 million. To finance loans, DNRC sells bonds on the open market.

Interest Rates

The rate of interest on the state's general obligation bond determines the interest rate for private loans. The basic rate for private loans has varied from 5.7 to 9.5% in part because the interest obtained by the state has varied. Tax law has also contributed to increased interest rates. Before 1986, state bonds sold to finance DNRC projects were tax-exempt. The tax law of 1986 thereafter prohibited financing private ventures with tax-free bonds. Therefore, bond sales to finance private projects after 1986 have been taxable (federal taxable, state tax-exempt). Because investors demand a higher interest rate on investments when their investments are subject to federal income tax, sale of these taxable bonds resulted in higher interest rates than those of the earlier, tax-exempt bonds.

In addition to interest costs, borrowers also pay a share of bond issuance costs proportionate to the percentage of the bond used to finance their loan. Higher interest rates and issuance cost charges have made private loans less attractive than those offered when the program first started. Although less attractive, private loans remain competitive with conventional financing because the rate on taxable bonds is still slightly under interest rates obtainable from conventional financing. DNRC's loans also provide financing at a fixed interest rate for a period longer than that available to borrowers through their local financial institutions.

Longer terms and competitive fixed interest rates, in most cases, make these loans continue to be attractive to borrowers interested in long-term financing for major equipment or system purchases. The exceptions are loans for less than \$10,000. For small loans, closing costs will outweigh the benefit of DNRC's lower interest rate. DNRC recommends those projects needing less than \$10,000 seek funding from other sources. Closing costs includes a \$150 non-refundable application fee and title insurance.

Loan Project Management

Borrowers must acquire all property rights necessary for the project including rights-of-way and interest in land needed for the construction, operation, and maintenance of the project. Title insurance, a title opinion, or other documents showing the ownership of the land, mortgages, encumbrances, or other liens must be provided to DNRC.

Loans must be secured with real property valued higher than the loan amount requested. According to statute, security equal to at least 125% of the loan's value is required. Loans may be secured with a first or second real estate mortgage, an assignment of accounts receivable, certificates of deposit, or similar securities, or other security as accepted by DNRC. To adequately secure the state's interest, DNRC requires a security equal in value to at least 150% of the loan. For example, a loan application for \$100,000 would require real estate security of \$150,000. DNRC will accept a second mortgage on property if the state's interest can be adequately secured. DNRC may require an appraisal of real property used for securing a loan. Cost of the appraisal must be paid by the applicant.

After an application is approved for financing, interim financing may be secured by the applicant, with interest costs included in DNRC's loan financing. The Renewable Resource Grant and Loan Program does not refinance existing loans; only new ventures are eligible.

Loans to private entities are disbursed by warrants drawn by the state auditor or wire transfers authorized by the state treasurer. Before disbursement can occur, all loan documents must be

properly signed, security documents must be filed with the county clerk and recorder, the final title insurance policy must be in force, and an invoice must be submitted by the borrower to document the use of funds.

Project Monitoring

Project construction is monitored by the NRCS if there is cost-share money involved, by the borrowers as they have a vested interest in the successful completion of the project, and by bureau staff through field visits when possible. Borrowers must maintain proper and adequate records of accounts that show the complete and correct entries of all receipts, disbursements, and other transactions related to the project and, if applicable, the monthly gross revenue derived from the project's operation. Any segregation and application of the gross revenue resolution also must be shown in such reasonable detail as may be determined by the borrowers in accordance with generally accepted accounting practices and principles.

Project Evaluation

Through its monitoring efforts, DNRC conducts an ongoing effort to evaluate the projects funded under the Renewable Resource Grant and Loan Program. DNRC will continue to review each final report as has been done in the past. This review will be documented to indicate whether the project successfully completed the objectives outlined in the original application as specified in the loan agreement.

Private Loan Projects Previously Funded

As of October 1998, 153 private loans had been approved since the program was started in 1991. A total of \$12,037,131 has been advanced, and \$85,000 is committed to projects but has not been disbursed. Loans have been used to finance projects involving new and refurbished irrigation systems, riprap, irrigation wells, and refurbishing private drinking water systems.

Private Loan Applications in Calendar Years 1997 and 1998

As of the end of September 1998, 21 loan applications had been received for the period of November 1996 through October 1998. Applicants requested a total of \$1,933,657. All of the applications were approved by DNRC's director and have received or will receive funding. Figure 9 lists the application requests received and DNRC's recommendations.

Figure 10 Private Loan Applications in Calendar Years 1997 and 1998

Contract Number	Amount Requested	Amount Approved
97-3223	\$63,055	\$63,055
97-3224	56,060	56,060
97-3225	74,240	74,240
97-3226	84,155	84,155
97-3229	36,000	36,000
97-3231	167,280	167,280
97-3232	112,775	112,775
97-3233	130,050	130,000
97-3234	115,000	115,000
98-3235	46,720	46,720
98-3236	147,320	147,320
98-3239	300,000	300,000
98-3240	46,316	46,316
98-3241	30,024	30,024
98-3243	200,000	200,000
98-3244	59,150	59,150
98-3247	103,000	103,000
98-3248	40,000	40,000
98-3249	32,512	32,512
99-3251	90,000	90,000
99-3255	85,000	85,000
TOTALS	\$1,933,657	\$1,933,657

Chapter 5

Emergency Grants and Loans

Application Administration and Project Review Procedures

In addition to the regular funding available during each Renewable Resource Grant and Loan Program funding cycle, limited funds are also available for immediate projects necessary to address qualified emergencies. These funds are reserved to help finance emergency projects otherwise eligible for grant or loan funding, or both, which, if delayed until legislative approval can be obtained, would allow substantial damage or legal liability to be incurred by the project sponsor.

Applications for emergency grants and loans are accepted by DNRC from public entities at any time an emergency occurs. No application fee is required.

Project Solicitation

No formal solicitation for applications is conducted. Engineering firms and other consultants likely to be involved with eligible emergency projects have been informed that emergency funds exist. During presentations to solicit applications for the regular public grant and loan program, the availability of emergency funding is discussed.

To request funds, applicants are required to submit a letter containing:

- a description of the problem;
- a statement of when the problem occurred;
- the proposed solution;
- cost estimates and documentation;
- and documentation of the community's financial condition and ability to otherwise pay for the desired repairs.

In calendar years 1997 and 1998, eight written requests for emergency grant funding were submitted to DNRC. Of the eight applications received, six projects were funded. There were no requests for emergency loans.

Application Review

As with funding for other renewable resource projects, emergency funds must be used for projects that measurably conserve, develop, manage, or preserve Montana's renewable resources. To qualify as an emergency, the project must be one that, if delayed until legislative approval can be obtained, will cause substantial damage or legal liability to the entity seeking assistance. All applications submitted are evaluated for technical as well as financial feasibility. Sponsors for those applications requiring more information are notified and asked to submit additional material immediately.

Requests for emergency funds are reviewed by DNRC staff. A DNRC staff engineer conducts a site visit to investigate the problem and to help determine feasible alternatives. During the site visit, the project is evaluated to determine its eligibility for funding under the Renewable Resource Grant and Loan Program. Projects must meet the statutory requirements of 85-1-605 (4), MCA, as a minimum to merit further consideration. Engineers and technical experts from other agencies or the private sector may be solicited for their opinions, guidance, and additional information.

Funding Recommendations

As discussed in Chapter 1, statute allows DNRC to request up to 10% of the grant funds available each biennium to fund emergency projects. In the past, DNRC has requested \$125,000 per biennium for emergency grants. DNRC will request \$200,000 during the 1999 session to fund emergency grants for fiscal years 2000 and 2001.

Funding recommendations are made on a case-by-case basis. As information is gathered and documented, a staff report with a funding recommendation is written and presented to DNRC's director for an official decision as to whether the project should receive emergency grant or loan funding. A maximum grant limit of \$30,000 is typically placed on individual projects. The limited total amount of funding available for the biennium dictates close management of funding recommendations for individual projects.

Project Management

Based on the decision of DNRC's director, the sponsor is notified of the status of its emergency funding application. If successful, the sponsor and DNRC enter into a formal agreement, and the project is managed in the same manner as other grants and loans.

Emergency Grant and Loan Applications in Calendar Years 1997 and 1998

Of the eight formal emergency grant applications received during 1997 and 1998, investigations determined that six met the urgency and need criteria that have been established for the program.

Each emergency grant request submitted during 1997 and 1998 was reviewed by DNRC staff and, based on the staff's recommendation, was approved for funding by DNRC's director. Total funding for all emergency grants may not exceed the legislative biennial appropriation for emergency projects under the Renewable Resource Grant and Loan Program. \$10,000,000 per biennium is available for emergency loans. Typically limited to \$30,000, an emergency grant may not be funded in an amount exceeding the biennial appropriation less the total of all emergency grants previously funded during the biennium.

Authorized Emergency Projects

In 1997, the legislature authorized \$125,000 for emergency grants. During the 1998-1999 biennium, funded emergency grant applications included the following:

City of Harlem

RRG-98-1067

\$30,000 Emergency Grant

In July 1997, DNRC was notified by the City of Harlem that the intake line to the municipal water treatment plant had apparently collapsed, and that emergency repairs were necessary. The city's water rates are above target rates as determined from median household income, and the community is currently planning major improvements to its water treatment plant, scheduled for construction in 1999. A DNRC engineer met with city officials and inspected the collapsed intake line on July 15th. On that day, it was apparent that sand was being pumped through the intake, and that the pump supplying water to the treatment plant's storage cell would fail if allowed to continue operating. The City of Harlem was awarded an emergency grant for \$30,000. An engineer was hired to determine the best method to replace the line, and a contractor completed the work at a

cost of \$30,810.74.

Lake County Land Services (Lake County)

RRG-98-1076

\$9,935.61 Emergency Grant

In April, 1997, DNRC was contacted by representatives of Lake County requesting emergency financial assistance to offset costs that property owners were incurring as the result of flooding south of Bigfork, near Woods Bay. Several properties and Montana Highway 35 were flooded as the result of unprecedently high groundwater tables caused by excessive snowpack and runoff in combination with little or no ground frost at the time of spring thaw. Lake County and affected property owners expended \$56,296.36. The money paid for a groundwater study to analyze the effects that a drainage siphon would have on surrounding wells and construction of the siphon. This effectively lowered the water table and its damaging effects to properties in the area. DNRC funded a portion of the actual construction of this project with an emergency grant in the amount of \$9,935.61.

Cartersville Irrigation District

RRG-98-1077

\$5,000 Emergency Grant

Record flows in the Yellowstone River in the spring of 1997 structurally damaged the Cartersville Irrigation District's diversion dam at Forsyth, leaving the dam susceptible to possible failure during the 1998 spring runoff season. In March 1998, the district contacted DNRC requesting financial assistance with the estimated \$10,000 project. Based upon the urgency of the project, current rates and ability to obtain loan funding, and the availability of cash reserves, DNRC authorized an emergency grant in the amount of 50% of the estimated project cost, or \$5,000. The project, consisting of the placement of large rock riprap to strengthen the dam, was completed at a cost of \$8,400. DNRC funded 50% of the project cost, \$4,200.

Town of Philipsburg

RRG-99-1080

\$30,000 Emergency Grant

Increased seepage observed at the toe of Fred Burr Lake Dam in the spring of 1998 prompted the Town of Philipsburg to conduct an engineering study. The town also consulted with DNRC's dam safety program to determine risk and evaluate rehabilitation alternatives for the high-hazard dam, which was constructed in 1937. The study determined that the outlet works was in need of immediate replacement, estimated to cost \$200,000. DNRC authorized an emergency grant for \$30,000. The additional funds necessary to complete the project were borrowed by the Town of Philipsburg from the local bank. The project was competitively bid, and the successful contractor completed the project in October for \$284,384.

City of Cut Bank

EC-CB-002

\$25,000 Emergency Grant (Environmental Contingency Grant Program)

In late March 1997, an earthen dike impounding untreated wastewater at the City of Cut Bank's wastewater treatment facility began to fail. The lagoon cell was immediately lowered, and a geotechnical engineer was hired to perform a study to determine the cause. It was determined that unstable soil conditions at the toe of the dam were the main contributors to the failure, and that the installation of a toe drain and sheet piling to stabilize the downstream slope of the dike were necessary. Because all available emergency funding through the Renewable Resource Program had been depleted by March 1997, DNRC recommended funding for Cut Bank in an amount not to exceed \$25,000 from the Environmental Contingency Grant Program. The project was

completed in April, 1997, at a cost of \$130,870.47. Funding consisted of this grant in the amount of \$25,000.00, with the balance borrowed by the City of Cut Bank through the State Revolving Fund Loan Program.

Cove Irrigation Company

EC-CI-003

\$30,600 Emergency Grant (Environmental Contingency Grant Program)

In July 1998, Cove Irrigation Company contacted the department to seek emergency financial assistance for the repair of its irrigation canal between Columbus and Park City. About 70 feet of concrete embankment had washed out on July 24, rendering the canal useless. Because of the urgency of the situation, the company had already hired an engineer and a contractor to repair the ditch immediately, since the success of high-value crops was dependent upon the system. The estimated cost of the project, based upon an actual quote from a qualified contractor, was \$60,000. Because the company is not a governmental entity eligible for funding through the Renewable Resource Program, DNRC recommended funding through the Environmental Contingency Grant Program in the amount of \$30,600, or approximately 50% of the total estimated cost of the project. The project was successfully completed within ten days of the failure.

Emergency Applications Not Recommended for Funding

Absarokee Town Ditch Association, Inc. (Stillwater Conservation District)

In March 1998, Stillwater Conservation District contacted the department on behalf of the Absarokee Town Ditch Association, Inc. High water early in 1997 had altered the channel of the East Rosebud River about three miles above the town of Absarokee, near the outlet structure owned by the Absarokee Town Ditch Association, Inc. Because of the channel change, there was concern that high water in the spring of 1998 would be uncontrollable at the inlet to the Absarokee Town Ditch, and that flooding and property damage would result. The Town Ditch Association, in conjunction with the Stillwater Conservation District, proposed to re-direct the river back into its original channel and stabilize the streambank with a combination of riprap, rootwads, and revegetation. The total cost of the project was estimated at approximately \$4,000. Consultation with streamflow dynamics experts indicated that the proposed stabilization measures were technically questionable, and that some minor earthwork would be adequately effective in rechanneling the river and preventing flooding. The work was accomplished at a cost of about \$1,000 and was paid for with Absarokee Town Ditch Association, Inc. cash reserves.

Lincoln County

In May 1998, Lincoln County requested financial assistance to conduct a geotechnical study to identify and alleviate sources of groundwater causing ongoing landslides in the Flower Creek drainage above the town of Libby. On May 13, 1998, a DNRC staff engineer attended a town meeting addressing the landslide issue, and, on May 14, toured the slide area. Due to the limited funding available through the emergency grant program, it is DNRC's policy to not recommend funding for preliminary studies, and the request was denied.

Chapter 6

Summary of Active Grants to Public Entities

The status of all projects that were active from July 1, 1997, to October 1, 1998, is reported here. Project status is reported in three categories: completed, active, and authorized but not executed.

Within each of these categories, projects are listed alphabetically by the name of the grant recipient.

Grant Projects Completed Since July 1, 1997

Chinook Division Irrigation District Joint Board of Control

Repair of Lohman Dam

RRG-95-1021

A \$36,173 grant was authorized by the legislature in 1993. A grant agreement was executed in December 1994. A total of \$25,480 was disbursed for the project. The project was completed in October 1997. Funds were used to rehabilitate Lohman Dam on the Milk River to ensure the dam's future reliability and to prevent excessive sand and silt from being diverted into the Fort Belknap Canal during irrigation.

Chouteau And Fergus Counties

Missouri River Streambank Stabilization Project at PN Bridge

RRG-97-1048

A \$50,000 grant was authorized by the legislature in 1995. A grant agreement was executed in August 1996. A total of \$50,000 was disbursed for the project. The project consists of furnishing and placing riprap along 1,000 feet of eroding Missouri River streambank in the vicinity of the PN Bridge. Completed in 1998, the project budget included local contributions, design and inspection by the NRCS, riprap material donations by BLM, and a 1997 grant from the DPWP.

Butte-Silver Bow Local Government

Blacktail Creek Restoration Project

RRD-93-5558

A \$100,000 grant was authorized by the legislature in 1991. A grant agreement has been issued; \$100,000 has been disbursed for the project. Funds were used to restore a 6,000-foot section of Blacktail Creek on the reach adjacent to the interstate. The stream restoration was part of a larger effort to restore the area north of I-90 that included construction of a visitor center and pedestrian walk-way adjacent to Blacktail Creek. The project was completed in November 1997.

Dodson Irrigation District

Improving Water Use Efficiency

RRG-95-1023

A \$31,569 grant was authorized by the legislature in 1993. A grant agreement was executed in April 1995. The project was successfully completed, with \$31,569.00 disbursed. Funds were used to replace 3,900 feet of old canal with 1,400 feet of plastic pipe to eliminate seepage from the canal to conserve water. The irrigation district is in the process of finalizing engineering plans for the project to prepare for bids. This irrigation district is part of the Milk River Irrigation Project.

City of Glasgow**Sanitary Sewer-Storm Sewer Separation Project-Phase I****RRG-98-1056**

A \$41,443 grant to the City of Glasgow was authorized by the 1997 Legislature. The purpose of the award was to help fund the construction of a storm sewer collection and disposal system on the south side of Glasgow. Also included in the project were improvements to the sanitary sewer collection system, the replacement of 70 manholes, and street repairs as necessary following construction. Construction began in 1997 and was completed in 1998.

Huntley Water and Sewer District**Water System Improvements Project****RRG-97-1049**

A \$100,000 grant was authorized by the legislature in 1993. A total of \$100,000 was disbursed.

The project consisted of improvements to the district's water supply, storage, and distribution system. A grant agreement was executed in September 1996. Drawings and specifications were submitted to DNRC and DEQ for review in October 1996. Construction was completed in 1997.

Hysham, Town of**Wastewater System Improvements Project****RRG-96-1047**

A \$50,000 grant was authorized by the legislature in 1995. A grant agreement was executed in June 1996. A total of \$50,000 has been disbursed. The project consisted of improvements to the town's existing wastewater collection and treatment system. The project was completed in 1997, and was formally closed out in 1998.

Lewistown, City of**Water System Improvements Project****RRG-96-1045**

A \$100,000 grant was authorized by the legislature in 1995. A grant agreement was executed in March 1996. A total of \$100,000 has been disbursed. The project consisted of improvements at the municipal water system's source at the head of Big Spring Creek, a new post-tensioned concrete storage reservoir, a new transmission main, and improvements to the distribution system. The project was completed in 1997.

Liberty County Conservation District**Sweetgrass Hills Groundwater Study Project****RRD-93-5560**

A \$100,000 grant was authorized by the legislature in 1991. A grant agreement was executed in July 1993. A total of \$93,967.56 was disbursed for the project. The project was completed in September 1997. Funds were provided to conduct a baseline assessment of groundwater resources in an eight-township area south of East Butte in the Sweetgrass Hills of north-central Liberty County. A report on the project findings was presented at the annual meeting of the Montana Chapter of the American Water Resource Association. A watershed group has formed to address the water quality problems identified as a result of the work performed under this grant.

Little Beaver Conservation District**Water Reservations Development and Implementation****RRG-94-1003**

A \$47,318 grant was authorized by the legislature in 1991. A grant agreement was executed in August 1993. The project was successfully completed, with \$46,725.33 disbursed. Funds were used to pay for legal and technical assistance to 11 conservation districts participating in the Lower

Missouri River Basin Water Reservation proceedings. All 11 conservation districts were granted water reservations.

Malta Irrigation District

Improving Water Efficiency on Dodson South Canal

RRG-94-1004

A \$50,000 grant was authorized by the legislature in 1993. A grant agreement was executed in September 1993. Funds were used to replace eight check structures located in the Dodson South Canal. The new structures (10-foot wide openings replaced 5-foot openings) will have automated gates that can better handle spring ice jams, which will enable more water to be captured earlier in the spring for irrigation and improved delivery. The project was successfully completed with \$37,264.44 in grant funds disbursed.

Montana Department of Natural Resources and Conservation

Beaverhead Groundwater Study Project

RRD-92-5551

A \$100,000 grant was authorized by the legislature in 1991. An agreement was executed in April 1992. A total of \$100,000 in grant funds have been disbursed for the project. The project was completed in February 1998. Funds were provided to study groundwater yields and the interaction with surface water in Beaverhead County. The information will allow DNRC to estimate the volume of water in the aquifer and the rates and general locations of aquifer recharge and discharge. A final study report was written and edited during the winter of 1996-1997 and submitted to the MBMG in February 1998.

Montana Department of Natural Resources and Conservation

Study of the Characteristics of Extreme Precipitation Events in Montana

RRG-94-1009

A \$100,000 grant was authorized by the legislature in 1993. A grant agreement was executed in October 1993. \$100,000 in grant funds have been disbursed for the project. Funds were used to develop frequency-based criteria for computing inflow design floods for Montana dams. As a result of the study, DNRC anticipates that design standards to meet Dam Safety Act requirements may be reduced. USGS expended \$116,000 in match funding on the project for a total of \$216,000. The project was completed and a USGS open file report was published in July 1998.

Montana Department of Natural Resources and Conservation

Flint Creek Return Flow Study

RRG-96-1032

A \$100,000 grant was authorized by the legislature in 1995. A grant agreement was executed in August 1995. \$83,027.72 in grant funds have been disbursed for the project. Funds were used to collect both surface and groundwater data needed for the Flint Creek water users to evaluate the management of water resources within the basin. Results from this study will provide Flint Creek ranchers with data needed to address future concerns dealing with fisheries, hydropower, and residential water supply. The project was completed in February 1998.

Montana Department of Natural Resources and Conservation

Fort Peck Rural County Water District

Regional Water System Federal Funding Procurement

RRG-96-1026

A \$30,000 grant was authorized by the legislature in 1995. A grant agreement was executed in July 1995. A total of \$30,000 in grant funds have been disbursed for the project. DNRC grant funds were used to compensate the Fort Peck Rural County Water District for expenses incurred in

procuring federal funding for a regional water system. The district's efforts have met with success in that Congress has authorized the expenditure of \$5.8 million in federal money for the design and construction of the project. Of the \$5.8 million currently authorized, \$1.5 million is appropriated for FY 99, and the district will seek the balance for appropriation in FY 2000. \$30,000 has been disbursed, and the project has been closed out.

**Nashua, Town of
Water System Improvements Project
RRG-95-1024**

A \$50,000 grant was authorized by the legislature in 1993. A grant agreement was executed in April 1995. A total of \$50,000 has been disbursed. The project consisted of water system improvements including a new 250,000-gallon storage reservoir, a new well, distribution system upgrades, and new pump and chlorination facilities. The project was completed in 1997.

**Stillwater Conservation District
Evaluation of Plastic Lining Project
RRD-93-5557**

A \$56,848 grant was authorized by the legislature in 1991. A grant agreement was executed in May 1993. The project was completed, with \$54,900 disbursed. Funds were used to line a 4,000-foot section of the Cove Ditch canal using a less costly, more effective and durable alternative to conventional ditch liners. The material is the same material tested under an earlier program grant.

**Thompson Falls, City of
Water System Engineering Study and Report
RRG-96-1034**

A \$51,820 grant was authorized by the legislature in 1995. A grant agreement was executed in September 1995. The project was completed in December of 1997. A total of \$49,460 in grant funds have been disbursed. The project consisted of an engineering study and the preparation of a water master plan. Areas of special concern were supply deficiencies and concerns, distribution system deficiencies including system losses, and boost pump and storage requirements. The plan is complete, and Thompson Falls is currently seeking funding for the design and construction of a new water supply source and distribution system improvements.

Active Grant Projects

**Beaverhead County
Big Hole River Return Flow and Water Budget Study
RRG-98-1058**

A \$100,000 grant was authorized by the legislature in 1997. A grant agreement was executed in July 1997. \$40,112.42 has been disbursed for the project. Funds were used to evaluate the role of groundwater and surface water interactions as they relate to river flow in the Big Hole River basin. This project will help to determine the relationship between river flow and groundwater flow as a result of precipitation, irrigation, livestock diversions, evapo-transpiration, and municipal withdrawals.

**Bozeman, City of
Separator Waste Collection Facility
RRG-96-1046**

A \$50,000 grant was authorized by the legislature in 1995. A grant agreement was executed in June 1996. No funds have been disbursed. The project consists of the construction of covered

treatment beds designed for the treatment of non-hazardous waste material from industrial sumps, traps, and collectors. An example is the material collected in drain sumps at car washing facilities. Following drying and treatment, the materials will be permanently disposed of at the municipal landfill. The City has not committed to borrowing the balance of the necessary funding for the project and, as a result, the project has not been constructed.

Butte-Silver Bow Local Government

Big Hole River Water Transmission Line Improvements Project

RRG-96-1028

The legislature authorized a \$100,000 grant in 1995. A grant agreement was executed in December 1995. No funds have been disbursed. The project consists of the replacement of 2,000 feet of leaking water transmission main. As of October 1998, the project is being designed by Butte-Silver Bow staff; plans have not been submitted for review. No disbursements have been made.

Butte-Silver Bow Local Government

Municipal Compost Pilot Study and Report

RRG-95-1020

A \$50,000 grant was authorized by the legislature in 1993. A grant agreement was executed in 1994. A total of \$31,429.03 has been disbursed. The project consists of a pilot study and demonstration of the potential technical and economic feasibility of mixing yard waste with sludge by-products from the municipal wastewater treatment plant to produce compost. The city and county would then use the compost for developing and maintaining parks, reclaiming abandoned industrial sites, or for other landscape projects. The pilot project is complete, and a final report is being drafted.

Town of Cascade

Wastewater System Improvements Project

RRG-98-1072

A \$100,000 grant was authorized by the legislature in 1997 for the construction of a lift station and treatment lagoon. No funds have been disbursed. The new lagoon, located north of I-15, will replace the existing lagoon located on an island in the Missouri River. Construction is 80% complete at the time of this writing, with completion scheduled for late fall, 1998.

Chinook Division Irrigation District Joint Board of Control

Milk River Water Supply Project

WDG-93-5104

A \$100,000 grant was authorized by the legislature in 1991. A grant agreement was executed in June 1993. A total of \$60,680 has been disbursed for the project. The Chinook Division is using the funds to repair aging infrastructure and improve irrigation efficiencies through canal lining, the installation of headgates, and other irrigation infrastructure improvements. The 172 farms within the Chinook Division District comprise just over 38,000 irrigated acres of the 92,000 acre Milk River Irrigation Project. The project will be completed in November 1998.

City of Choteau

Wastewater System Improvements Project

RRG-98-1070

In 1997, the legislature granted the City of Choteau \$100,000 to fund the design and construction of an improved wastewater collection system. To date, a total of \$17,078.48 has been disbursed. A study to locate critically deficient sections of the system was completed in 1998, and the design of improvements is in progress. Construction is scheduled for 1999.

**Department of Natural Resources and Conservation
Deadman's Basin Irrigation System Improvements Project
RRG-97-1054**

A \$47,919 grant was authorized by the legislature in 1995. A grant agreement was executed in 1997. A total of \$2,000 has been disbursed. The project consists of improvements to the Barber Canal designed to increase its flow capacity, thereby reducing flows in the Careless Creek Canal and decreasing sediment transport from Careless Creek to the lower Musselshell River. The project bid in the fall of 1998 and construction is currently in progress.

**Eastern Agricultural Research Center
Alternative Irrigation Systems and Alternative Crops
RRG-98-1064**

A \$60,000.00 grant was authorized by the legislature in 1997. A grant agreement was executed in December 1997. To date, \$21,178.35 has been disbursed for the project. The purpose of this project is to demonstrate the economic potential of high-value crops grown under mechanical sprinkler irrigation in eastern Montana and western North Dakota. The project will compare performance of these crops under sprinkler irrigation versus flood irrigation, and compare irrigation efficiencies and groundwater nitrate levels under the two different irrigation methods.

**Fairview, Town of
Water System Improvements Project
RRG-96-1027**

A \$100,000 grant was authorized by the legislature in 1995. A grant agreement was executed in August 1995. A total of \$90,000 has been disbursed. The project, consisting of improvements to the municipal water storage and distribution system, was substantially complete early in 1998. \$10,000 in grant funding remains to be disbursed, pending the receipt of a final report.

**Flathead Basin Commission
Flathead Lake Watershed Education Plan
RRG-96-1043**

A \$100,000 grant was authorized by the legislature in 1995. A grant agreement was executed in January 1996. \$10,904.54 has been disbursed for the project. The purpose of the Flathead Lake and Watershed Education Plan is to facilitate and encourage, through public involvement, the integration of science, management, and policy to enhance water management and to protect the water quality within Flathead Lake and the surrounding watershed.

**Fort Shaw Irrigation District
Irrigation Efficiency and Water Quality Improvements
RRG-98-1060**

Two \$50,000 grants were authorized by the legislature in 1991 to rehabilitate the district's head-works on the Sun River and to complete a rehabilitation planning study. The authorization was changed in 1995 and again in 1997 to complete infrastructure improvements. A grant agreement for the current project was executed in September 1997. Of the \$100,000 available in grant funding, a total of \$51,814.43 has been disbursed. The project has resulted in the installation of a measuring device and remote operating controls for the main diversion structure. The project will also result in improved transport efficiencies through canal lining. The district is currently seeking additional grant funding to continue their goal of system rehabilitation.

**Gallatin Local Water Quality District
Groundwater Evaluation and Monitoring Project
RRG-98-1057**

A \$100,000 grant was authorized by the legislature in 1997. A grant agreement was executed in September 1997. \$53,985.70 has been disbursed for the project. Funds are being used to protect, preserve, and improve the quality of groundwater and to provide the basis for understanding the groundwater resources of the Gallatin Local Water Quality District, and for development of preventative measures needed to ensure a continued supply of clean groundwater. This project will provide accessible information for making sound public and private land-use decisions and to develop guidelines and provide a basis for protection and future groundwater resource management.

**Glasgow Irrigation District
Vandalia Dam Rehabilitation Study
RRG-98-1061**

A \$98,221 grant was authorized by the legislature in 1997. A grant agreement was executed in October 1997. \$81,000 has been disbursed for the project. Funds are being used to complete a rehabilitation plan for the aging structure. The rehabilitation plan is complete and the district has applied for additional funds to implement the first phase of the plan. The remaining funds are being used to complete and evaluate test repairs. Constructed in 1915, the Vandalia Dam is the district's main diversion structure on the Milk River. It provides water to 106 farms on approximately 18,000 acres.

**Granite Conservation District
Upper Clark Fork River Basin Water Management Plan
RRG-96-1040**

A \$64,740 grant was authorized by the legislature in 1995. A grant agreement was executed in November 1995. \$26,766.09 has been disbursed for the project. The purpose of this project is to establish and operate the successor to the Upper Clark Fork River Basin Steering Committee and its watershed committees. This effort will involve work on specific water quality and quantity fishery improvement projects. Activities include education and outreach programs for basin water rights holders and individuals interested in water issues. The plan will identify short- and long-term water management issues, and formulate alternatives for the resolution of identified problems.

**Hill County
Salinity Control Project
RRG-97-1055**

A \$50,000 grant was authorized in 1993. A grant agreement was issued in April 1997. A total of \$30,703.05 has been disbursed for the project. Funds are being used to install a drainage control system at the fairgrounds. The area suffers from an acute saline problem. The balance of the \$175,000 project was provided by funds from the federal CTEP program administered by the Department of Transportation. The project was completed in November 1998.

**Hill & Liberty County Conservation District
Water Resource Evaluation of the Sage Creek Watershed
RRG-98-1074**

A \$40,622 grant was authorized in 1997. A grant agreement was disbursed in June 1998. No funds have been disbursed for the project. The project will asses the cause of water quality degradation in the middle portion of the Sage Creek. Lab analysis has revealed a high bacterial counts, nitrate levels, and total dissolved solids in Sage Creek. Some analyses have shown salinity levels in the creek that exceed seawater. The assessment will provide information essential for future salinity

remediation. The project is being conducted in coordination with a grant from EPA to examine these problems in the watershed.

Lewis And Clark County Water Quality Protection District

Helena Area Bedrock Aquifer Assessment

RRG-96-1033

A \$100,000 grant was authorized by the legislature in 1995. A grant agreement was executed in August 1995. A total of \$86,357.43 has been disbursed for the project. Funds are being used to assess the bedrock aquifer systems that recharge 45% of the Helena Valley alluvial aquifer. This aquifer provides the only source of water for residents living in the bedrock areas.

Lake County Land Services

Technical Study of Advanced and Conventional Septic Systems

RRG-98-1076

A \$100,000 grant was authorized by the legislature in 1997. A grant agreement was executed in March 1998. A total of \$5,715.00 has been disbursed for the project. This project will provide state and local regulators as well as property owners with information on the performance of individual, on-site wastewater treatment and disposal systems. The project has completed the data acquisition phase. Field demonstrations on waste treatment systems will begin in the spring of 1999.

Lincoln Lewis and Clark County Sewer District

Lincoln Wastewater System Improvements Project

RRG-97-1052

In 1995, the legislature authorized a \$15,000 DNRC grant to the Lincoln Lewis and Clark Sewer District for miscellaneous improvements to the municipal wastewater collection and treatment system. A grant agreement was executed in November 1996. \$4,000 of the appropriation has been used for an inflow and infiltration study, and \$9,740 has been disbursed for equipment upgrades. The study is being used to design a major improvements project, which is currently in the planning stages.

Madison Conservation District

Willow Creek Demonstration Watershed Project

RRG-97-1051

A \$25,000 grant was authorized by the legislature in 1995. A grant agreement was executed in October 1996. \$21,420 has been disbursed for the project. Project funds were used to install a Sno-Tel site in the Willow Creek drainage of the Tobacco Root Mountains. The district has joined with the USFS, Indiana State University, and NRCS in developing a demonstration watershed management project that will provide real-time water supply data to assist water users in irrigation management. The remaining project funds will be used for project administration and operation and maintenance of the Sno-Tel site.

Manhattan, Town of

Water System Improvements Project

RRG-96-1025

A \$50,000 grant was authorized by the legislature in 1995. In July 1995, a grant agreement was executed for \$33,000 based on a reduced scope of work for the project. \$26,100 has been disbursed. The project consists of the installation of a new groundwater collector system, transmission main, and chlorination vault. The collector was constructed in December 1995 and has undergone required testing since construction. Construction of the remainder of the project is substantially complete. A final report has not been received at the time of this writing, and the project has not been formally closed out.

City of Missoula**Reserve Street South Sewer Project****RRG-98-1068**

The City of Missoula received a \$100,000 grant in 1997 to help fund the construction of a gravity-flow wastewater collection system in a large, unsewered area of the city. No funds have been disbursed for the project. Design began in 1997, and construction commenced during the summer of 1998. At the time of this writing, construction is in progress, with completion of Phase I scheduled for this fall.

Missoula County**Public and Private Partnerships For Protecting Water Resources Through the Conservation of Riparian Areas: a Model Project****RRG-96-1041**

A \$100,000 grant was authorized by the legislature in 1995. A grant agreement was executed in January 1996. A total of \$23,732.50 has been disbursed for the project. Funds are being used to design, implement, and evaluate a model for establishing public-private partnerships aimed at protecting the area's water resources and wildlife habitats by conserving critical private riparian land. Funds are used for land appraisals, baseline data, and title searches and fees that are required for the completion of a conservation easement with a private land trust.

Montana Department of Environmental Quality**Direct Planning Grants To Small Communities****RRG-98-1063**

A \$100,000 grant was authorized by the legislature in 1997. A grant agreement was executed in December 1997. A total of \$19,210.50 has been disbursed for the project. Funds for this project have been used by small, needy communities to procure the services of consulting engineers to prepare facility plans for drinking water and wastewater projects.

Montana Department of Fish, Wildlife and Parks**Assessment of Aquatic Resources in the Blackfoot River Basin****RRG-96-1036**

A \$100,000 grant was authorized by the legislature in 1995. A grant agreement was executed in September 1995. A total of \$90,594.05 has been disbursed for the project. Funds for this project have been used to conduct a reconnaissance assessment of the aquatic resources of the Blackfoot River basin, and to design and operate a monitoring network for long-term assessment of the aquatic resources of the basin. The project includes the development of a centralized and comprehensive computer data base for water resources information in the basin.

Montana Department of Natural Resources and Conservation**Flathead Valley Cooperative Groundwater Study****RRG-94-1016**

A \$100,000 grant was authorized by the legislature in 1993. A grant agreement was executed in June 1994. A total of \$89,736.64 in grant funds have been disbursed for the project. Funds are being used to develop a detailed technical framework for responsible groundwater management in the Kalispell area. The project was extended to permit data collection over two concurrent water years. All data are complete and awaiting compilation in a final project report. A number of personnel changes have hindered project completion, however, DNRC plans to finish a final report in the fall of 1999.

**Montana Department of Natural Resources and Conservation
Rocky Boys/North Central Montana Regional Water Supply System
Off-Reservation Needs Assessment and Federal Funding Procurement
95RB000**

In 1995, the legislature authorized the expenditure of \$30,000 in DNRC grant funds to offset costs associated with the development of a large regional water system in north central Montana. To date, a total of \$10,801.28 has been expended. The project, now known as the Rocky Boys /North Central Montana Regional Water Supply System, also received \$300,000 in federal funding for the study and preparation of a feasibility report. The report is complete, and community sponsorship of the project is currently being determined. Approximately 30% of the grant funding was used to gather information necessary for the feasibility study; the remaining 70% has not been disbursed.

**Montana Tech of the University of Montana, Montana Bureau of Mines And Geology
Groundwater Protection And Education in Montana Schools**

RRG-96-1042

A \$84,560 grant was authorized by the legislature in 1995. A grant agreement was executed in December 1995. To date, \$52,481.90 has been disbursed for the project. Funds are being used to develop wellhead protection plans for eight rural schools in Montana. These schools derive their water supply from groundwater. These plans will be certified and meet requirements of the Safe Drinking Water Act.

**Montana Tech of the University of Montana, Montana Bureau of Mines And Geology
Groundwater Protection And Education in Montana Schools**

RRG-98-1079

A \$49,899 grant was authorized by the legislature in 1997. A grant agreement was executed in June 1998. No funds have been disbursed. The project will use funds to protect groundwater supplies through an education approach in our primary and secondary school systems. This will be accomplished by having educators and students in conjunction with MBMG personnel develop a wellhead protection plan for their school well. The proposed program is a unique approach that will require an interdisciplinary effort and achieve active student participation. Primary and secondary school students will learn basic scientific principles and relate them to the area in which they live.

**Montana Tech of the University of Montana
Hydrologic Evaluation for Florence and Seeley Lake**

RRG-96-1037

A \$95,422 grant was authorized by the legislature in 1995. A grant agreement was executed in October 1995. \$60,118.56 in grant funds have been disbursed. The project consists of a hydrologic study to determine the impact to groundwater as a result of rapid development in the communities of Florence and Seeley Lake. The study is currently in progress.

**Town of Neihart
Water Distribution System Improvements**

RRG-98-1059

A \$100,000 grant was authorized by the legislature in 1997. A grant agreement was executed in 1997. \$86,551.89 in grant funds have been disbursed. The project will replace the antiquated and shallow municipal water distribution system. Construction occurred in 1997 and early 1998. At the time of this writing, minor cleanup work and punch-list items remain to be completed. The project is substantially complete, and it is in operation.

**Pondera County Conservation District
Lake Frances Shoreline Rehabilitation
RRG-98-1066**

A \$20,000 grant was authorized by the legislature in 1997. A grant agreement was executed in November 1997. To date, \$20,000 has been disbursed for the project. Funds are being used to construct a bulkhead on the eastern shoreline of Lake Frances to prevent erosion from wave action. The erosion is degrading water quality for recreation, fisheries, and drinking water. Erosion is so severe that trees and other riparian habitat have been destroyed, and the use of a public campground at the site is threatened. The bulkhead is complete and the addition of seeding and planting in the riparian zone will complete the project.

**Ravalli County, Board of Commissioners
Ravalli County Groundwater Vulnerability Assessment
RRG-94-1018**

A \$70,672 grant was authorized by the legislature in 1993. A grant agreement was executed in July 1994. To date, \$62,792.59 has been disbursed for the project. Funds have been used to document the hydrogeologic history and to map areas vulnerable to groundwater pollution on non-federal lands in Ravalli County. Resulting maps will be used to plan and make decisions concerning land use and water-related development in the county. The project was extended to permit the collection of additional data from the Hamilton Heights focus area. The final study report will be completed in the spring of 1999.

**Roosevelt County Conservation District
Regional Water System Needs Assessment and Feasibility Study
RRG-98-1069**

Roosevelt County Conservation District received a \$64,561 grant in 1997. Grant proceeds are being used to pay costs associated with evaluating the need for and the feasibility of including a large four-county area in northeastern Montana with the Fort Peck Assiniboine and Sioux Rural Water Project, a large regional water project on the Fort Peck Reservation that is currently seeking federal funding. Currently 70% complete, the study has been in progress since January 1998.

**Ruby Valley Conservation District
Ruby River Water Management and Conservation Program
RRG-98-1065**

A \$99,741 grant was authorized by the legislature in 1997. A grant agreement was executed in November of 1997. To date, \$6,905.97 has been disbursed for the project. The project will use funds to install 8 adjustable headgates and 19 measuring devices on the Ruby River. Better water management will increase the amount of water available for the Ruby's well-known fishery. Improvements to irrigation infrastructure should also improve water quality through the reduction of irrigation return flows. The project is coordinated in conjunction with several other state and federal grants.

**Ruby Valley Conservation District
Upper Ruby Water Developments and Riparian Area Improvements
RRG-94-1005**

A \$100,000 grant was authorized by the legislature in 1993. A grant agreement was executed in September 1993. To date, \$77,353.67 has been disbursed for the project. Funds are being used to make range improvements on the Upper Ruby Cattle and Horse Allotment. These improvements are designed to decrease livestock use on riparian areas, while simultaneously increasing the use of uplands to improve riparian conditions. Twenty-nine offstream watering sites and 14.9 miles of fence will be installed. In addition, the permittees will provide three range riders to ensure that

livestock are properly distributed. All of the water developments are installed and the fencing will be completed in the fall of 1998. A project report will be completed and the project closed out in January 1999.

Sheridan County Conservation District - Administration of Water Reservation, Hydrologic System Monitoring Program

RRD-89-5529-2

Funding of \$8,952.31 was awarded to the project sponsor from Water Reservations Development Funds in 1995. A grant agreement was executed in February 1996. To date, \$4,474.76 of grant funds have been disbursed. The funds are being used to administer the water reservation granted to the district in December 1994. This includes implementation, oversight, and administration of a hydrologic monitoring program of the groundwater source associated with the water reservation.

Sheridan County Conservation District

Sheridan County Groundwater Management Program

RRG-98-1062

A \$95,412.00 grant was authorized by the legislature in 1997. A grant agreement was executed in October 1997. To date, \$10,299.77 has been disbursed for the project. Funds are being used to review reserved water use applications for groundwater use, monitor aquifer and surface water conditions, and to estimate how water can be pumped from the aquifer without substantially affecting other water users.

Sun River Water And Sewer District

Water System Engineering Study and Report (Second Study)

RRG-96-1030

A \$50,000 grant was authorized by the legislature in 1995. Grant funds were authorized for both an engineering study and construction. To date, \$26,505.18 has been disbursed. The project is for the development of municipal water supply, storage, and distribution system. The engineering study has failed to identify a reliable source of quality groundwater, and surface water sources are being investigated. The feasibility of developing a regional system is also being considered.

Town of Twin Bridges

Water Storage and Distribution System Improvements Project

RRG-98-1073

The 1997 legislature authorized a \$100,000 grant to the Town of Twin Bridges to help fund the construction of a new water storage reservoir and the replacement of a major portion of the existing distribution system. Design was completed in the spring of 1998, and construction began late in the summer. Currently in progress, the project is scheduled for completion late this year or in the spring of 1999, dependent upon weather this winter. No grant funds have been disbursed for the project.

Town of Valier

Wastewater Treatment Facility Upgrade

RRG-98-1075

In 1997, the legislature authorized a \$100,000 grant to the Town of Valier for reconstruction of its existing wastewater treatment lagoon. The project consists of sludge removal, the abandonment of the existing facultative cell, and the reconstruction of three smaller cells, including an aerated primary cell. Construction began early in the summer of 1998 and is in progress at the time of this writing, with completion scheduled for late October. No grant funds have been disbursed for the project.

Authorized Projects Not Yet Executed

Cascade County Conservation District Agrimet Irrigation Water Management Project 97CC000

A \$100,000 grant was authorized by the legislature in 1997. No grant agreement has been executed, and no funds have been disbursed for the project. Funds were awarded to continue the development and expansion of the Agrimet Program in Montana. This project is an on-farm irrigation management program with the goal of reducing energy costs and water usage through precise irrigation scheduling and water management practices.

East Glacier Water and Sewer District Midvale Diversion 93EG000

A \$25,905 grant was authorized by the legislature in 1993. No grant agreement has been executed. The scope of work consists of constructing a diversion structure at the water supply reservoir. Its purpose will be to allow diversion of the community water supply during cleaning operations in the reservoir. The district has received an EPA grant, and pilot testing and design of a new filtration plant are currently in progress. It is anticipated that this project will be constructed as part of the larger treatment plant project in 1999.

East Missoula Sewer District Wastewater Collection and Treatment System 97EM000

A \$100,000 grant was authorized by the legislature in 1997 for the construction of a new wastewater collection and treatment system for the community of East Missoula. The district has not been able to negotiate the purchase of a suitable site for the treatment lagoons and is in the process of negotiating with the City of Missoula to connect to its municipal system. The project will now consist of a collection and pumping system, with design in the preliminary stages and construction scheduled for 2000.

Greenfield's Irrigation District J-Lake Re-regulation Reservoir 97GD000

A \$100,000 grant was authorized by the legislature in 1997. No grant agreement has been issued. Funds have not yet been disbursed for the project. Funds were approved to construct a reservoir to prevent excess canal water and irrigation return flows from entering Muddy Creek. The project was abandoned in favor of more pressing infrastructure needs in the district.

Jackson Water and Sewer District Geothermal Development Feasibility Study 95JW000

A \$25,000 grant was authorized in 1995. No grant agreement has been issued; funds have not yet been disbursed for the project. Funds were requested to investigate the geothermal heat potential of the hot spring located in town. Since the project was only partially funded, the town has not pursued completion of the feasibility study. It was felt that the limited grant funding would be more useful as a demonstration project. Plans to construct a community greenhouse that relies on the available geothermal resources have been discussed.

Montana Reserved Water Rights Compact Commission

Chippewa Cree Reserved Water Right Settlement Project Implementation

The legislature authorized a \$150,000 grant in 1997. No grant agreement has been issued; funds have not yet been disbursed for the project. Funds have been requested for the state's cost share for the compact among the state, the Chippewa Cree Tribe of the Rocky Boys Reservation, and the United States. The grant will fund improved irrigation diversion structures on Big Sandy and Beaver creeks to allow efficient use of irrigation water and to facilitate water rights enforcement.

Park County

Hydrologic Reconnaissance of the Paradise Valley

The legislature authorized a \$100,000 grant in 1997. Since the project ranked below the limit of available funding, a grant agreement will not be executed unless funding becomes available. Funds have been requested to provide unbiased scientific information regarding the basin-fill aquifers that underlie the Paradise Valley. The proposed project will describe the general characteristic of the basin-fill aquifers; determine the altitude of the water table and general direction of groundwater flow; identify important recharge and discharge areas; characterize groundwater quality; and design a long-term monitoring system.

City of Thompson Falls

Water Line Replacement

97TF000

The legislature authorized a \$100,000 grant in 1997. The purpose of the grant is to fund improvements to the municipal drinking water distribution system. Since the project ranked below the available funding limit, funding only became available when the authorization for the Greenfields Irrigation District was abandoned in September 1998. Thompson Falls was notified that the funding was available for its project. The grant agreement is currently in the draft stages.

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